



Final Work Plan & Health and Safety Plan

Split Spoon Soil Sampling and Soil Disposal

Willow Glen Golf Course
Naval Station Great Lakes
Great Lakes, Illinois

Environmental Job Order Contract No. N68950-00-D-0200

Delivery Order No. 0082

TolTest Project No. 73742.01

Prepared for:

Department of the Navy
Naval Station Great Lakes
Environmental Department
Building 1-A, 201 Decatur Avenue
Great Lakes, Illinois 60088-5600

Submitted by:

TolTest, Inc.
1000 S. Northpoint Boulevard
Waukegan, Illinois 60085
Ph: (847) 689-0697
Fx: (847) 689-0698

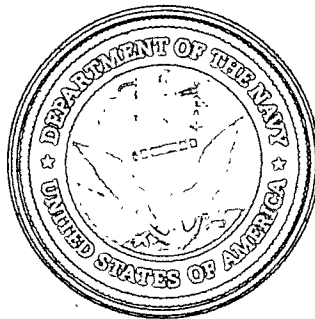
October 2003

TOLTEST, INC.

**ENVIRONMENTAL JOB ORDER CONTRACT
NO. N68950-00-D-0200
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**FINAL WORK PLAN & HEALTH AND SAFETY PLAN
SPLIT SPOON SOIL SAMPLING AND SOIL DISPOSAL
WILLOW GLEN GOLF COURSE
NAVAL STATION GREAT LAKES
GREAT LAKES, ILLINOIS**

PREPARED FOR



**DEPARTMENT OF THE NAVY
NAVAL STATION GREAT LAKES—
ENVIRONMENTAL DEPARTMENT
BUILDING 1-A, 201 DECATUR AVENUE
GREAT LAKES, ILLINOIS 60088-5600**

**SUBMITTED
OCTOBER 2003**

BY

***TOLTEST* INC.**

**1000 S. NORTHPOINT BOULEVARD
WAUKEGAN, IL 60085
(847) 689-0697
FAX (847) 689-0698**

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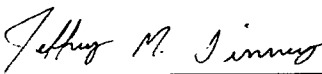
EJOC NO. N68950-00-D-0200
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Submitted by:

TolTest, Inc.
1000 S. Northpoint Boulevard
Waukegan, IL 60085


TolTest, Inc. hereby certifies that, to the best of its knowledge and belief, the technical data delivered herewith under this contract is complete, accurate, and complies with all requirements of the contract.

Prepared by:


Jeffrey M. Tinney, Project Manager

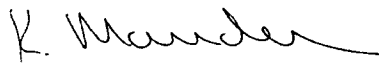
Date: 10/22/03

Reviewed by:


Lynn Smith, Geologist

Date: 10/22/03

Approved by:


Khushwant Mander, Senior Project Manager

Date: 10/22/03



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LIST OF ACRONYMS

bgs	Below ground surface
CFR	Code of Federal Register
DO	Delivery Order
DOCR	Delivery Order Closure Report
HASP	Health and Safety Plan
IEPA	Illinois Environmental Protection Agency
NTR	Navy Technical Representative
OSHA	Occupational Safety and Health Administration
PPE	Personal Protective Equipment
RCRA	Resource, Conservation, and Recovery Act
SSHO	Site Safety and Health Officer
SVOC	Semi-volatile Organic Compounds
TACO	Tiered Approach to Corrective Action Objectives
TolTest	TolTest, Inc.
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compounds



EXECUTIVE SUMMARY

TolTest, Inc. (TolTest) has been retained by the Department of the Navy, Naval Facilities Engineering Command under Contract No. N68950-00-D-0200, Delivery Order (DO) No. 0082 to collect 10 subsurface soil samples and three groundwater samples along a 250 yard section of the Skokie storm sewer located at the Willow Glen Golf Course, Naval Station Great Lakes in Great Lakes, Illinois. TolTest will also load, transport, and dispose of the excavated soil generated during the repair of the Skokie storm sewer.

The Willow Glen Golf Course is located to the north of Buckley Road and east of Route 41. The area TolTest will be sampling was formerly utilized as a landfill by the Navy. Previous subsurface soil samples indicated the presence of heavy metals and semi-volatile organic compounds (SVOCs) above the Illinois Environmental Protection Agency's (IEPA) Tiered Approach to Corrective Action Objectives (TACO) for commercial properties.

The 10 subsurface soil samples that TolTest collects will be analyzed for SVOCs, Resource, Conservation, and Recovery Act (RCRA) Metals, and volatile organic compounds (VOCs). The three groundwater samples will be analyzed for SVOCs and RCRA Metals. The data obtained from the soil samples will be compared to the TACO residential and commercial property remediation objectives. The purpose of collecting these soil samples is only to evaluate the subsurface environmental quality conditions and not to obtain any type of closure under TACO or the Soil Remediation Program outlined by the IEPA.

TolTest will utilize a solid stem auger to drill below the landfill debris located along the Skokie storm sewer. Once the solid stem auger has been advanced below the landfill debris, TolTest will collect one soil sample utilizing a split spoon sampler. The soil borings will be advanced to below the landfill debris or a maximum depth of 30-feet below ground surface (bgs).

TolTest will collect one groundwater sample from three random soil borings identified by the Navy Technical Representative (NTR). Once the NTR has identified the borings, TolTest will insert temporary well screens into the borings to collect the groundwater sample utilizing a peristaltic pump.

TolTest will load, transport, and dispose of the excavated soil generated during the storm sewer repair activities. TolTest has collected and analyzed composite samples of the excavated soil and submitted a copy of the laboratory analytical report to the Kestrel Hawk Landfill in Racine, Wisconsin. The Kestrel Hawk Landfill has accepted the excavated soil as special waste.



PART I – WORK PLAN

1.0 INTRODUCTION

This Work Plan outlines the procedures that will be utilized for the advancement of 10 soil borings, collection of 10 split spoon soil samples, collection of three random groundwater samples, and transportation and disposal of the excavated soil generated during the repairs to the Skokie storm sewer.

The tasks that TolTest will perform shall include, but are not limited to, the following tasks:

- Collect and analyze composite soil samples from two excavated soil stockpiles located at the Willow Glen Golf Course.
- Advance 10 borings to a maximum depth of 30-feet bgs.
- Collect ten split spoon soil samples from the 10 borings.
- Collect groundwater samples from three random borings.
- Submit the soil and groundwater samples to Suburban Laboratories for analysis.
- Backfill the borings with bentonite chips.
- Load, transport, and dispose of the excavated soil generated during the storm sewer repair activities.
- Provide the Department of the Navy with a Delivery Order Closure Report (DOCR) documenting the field activities.



TABLE I-2 EQUIPMENT, PERSONNEL, AND SUBCONTRACTORS

This section details the equipment, personnel, and subcontractors to be utilized to complete the tasks for this project. TolTest personnel will be utilized for the soil sampling and soil disposal activities.

Personnel assigned to this project may change, if needed, to efficiently complete the tasks defined in this Work Plan. Should any personnel changes occur, the replacement personnel shall have an equivalent background to that of the individual being replaced. TolTest will coordinate the use of all subcontractors utilized to complete this DO. **Table I-1** contains the equipment, TolTest personnel, and subcontractors that will be utilized to complete this DO.

Table I-1 Equipment, Personnel, and Subcontractors

EQUIPMENT	TOLTEST PERSONNEL	SUBCONTRACTORS
Field Truck Photoionization detector (PID) 02/Lower Explosive Limit (LEL) detector Dump truck Backhoe Excavator Assorted Hand tools 55-gallon drums	Jeff Tinney, Project Manager Tim Boos Site Superintnendent, Site Safety and Health Officer Chris White Driller Jay Shrader Driller	Suburban Laboratories Sample Analyses Kestrel Hawk RDF Construction Debris and Contaminated Soil Disposal Kirschoffer Trucking Transportation of soil



TABLE I-2 FIELD WORK SEQUENCE AND OPERATIONAL APPROACH

The field work sequence and operational approach for the soil and groundwater sampling and disposal are defined in the following sections.

Table I-2 Notification

A request for a utility locate will be made to Ms. Judy Jarosz, Base Utility Coordinator, at least five working days prior to advancing the soil borings. The area in the vicinity of the Skokie storm sewer will be evaluated for the presence of underground utilities.

TolTest will provide Mr. Kelly Devereaux, Environmental Department Operations Manager, with a waste profile for the excavated soil. After Mr. Devereaux signs the waste profile, TolTest will submit the approved waste profile to the Kestrel Hawk Landfill in Racine, Wisconsin for acceptance.

Table I-2 Mobilization and Site Set-up

Upon receiving a notice to proceed from the NTR, TolTest will mobilize the drill rig to the site. Prior to the drilling activities, TolTest and the NTR will identify the locations of each of the ten sample points. TolTest and the NTR will coordinate the route in which the drill rig will use to drive to the site to minimize interference with golfers on the golf course. TolTest will adhere to the route identified by TolTest and the NTR when entering or exiting the work area.

Table I-2 Subsurface Soil and Groundwater Sampling

After the sample points are identified by the NTR, TolTest will utilize a drill rig to advance a solid stem auger through the landfill debris into native soil. Each soil boring will be given a unique identification number and the TolTest geologist will document the drilling activities using a soil boring log forms. Depending on the depth of the landfill debris, the solid stem auger could be advanced to a maximum depth of 30-feet bgs. Soil cuttings generated from the drilling activities will be placed in 55-gallon drums.

After the solid stem auger has been advanced to the appropriate depth, the auger will be removed from the borehole and a split spoon sampling device will be lowered into the borehole. The split spoon sampling device will be advanced two feet beyond the bottom of the borehole using a hydraulic hammer. The sampler will then be removed from the borehole and opened to record the physical characteristics and percent recovery of the sample. The soil sample will be classified on the boring log indicating lithologic descriptions and Unified Soil Classification System descriptions (based upon visual evaluation), degree of sorting, sedimentary contacts, relative moisture content, etc. Each soil sample will be subdivided into separate packages.

A representative portion of each sample will be placed into laboratory-supplied jars with Teflon-lined lids and the portion for SVOCs, VOCs, and RCRA Metals.



The sampling equipment will be decontaminated prior to each sampling run utilizing a Liquinox[®] soap and deionized water rinse to minimize the potential for sample cross-contamination. The sampling equipment will be decontaminated according to the following procedures:

- Wash in soapy water (Liquinox[®] or equivalent)
- Rinse in potable water
- Air dry
- Rinse with distilled water
- Air dry

Because the Navy has requested that three random groundwater samples be collected as part of this project, TolTest is proposing to complete the temporary groundwater sampling points as temporary piezometers. The temporary piezometers will be constructed of 1-inch ID, schedule 40, flush joint PVC risers and screens. The three soil borings identified by the NTR to be samples will have dedicated pipe installed. Approximately ten feet of 0.010-inch machine slotted screen and a sufficient length of riser will be placed in each boring to bring the top of each piezometer to near grade level. The screened interval of each piezometer will be installed so as to intersect the apparent water table, if possible. Due to the limited scope of this project, the temporary piezometers will not have a filter pack or bentonite seal installed. However, the groundwater samples, water level data, and survey data will be collected as soon as practicable after piezometer installation at each site so that the soil borings are left open as short a time as possible. Samples will be obtained from the piezometers with a peristaltic pump connected to dedicated tubing. Water level measurements will be obtained with an interface probe/water level meter and each sample location will be surveyed with global positioning system. After the necessary data is collected, the piezometer pipes will be pulled from the ground and the soil borings will be backfilled with bentonite chips.

3.4 Soil Disposal

After the soil and groundwater samples have been collected and the bore holes backfilled with bentonite, TolTest will load, transport, and dispose of the excavated soil stockpiles. As previously mentioned, TolTest collected waste characterization samples from the two soil stockpiles. TolTest provided Mr. Devereaux with the laboratory analytical report and waste profile. Mr. Devereaux signed the waste profile and the signed waste profile was submitted to the Kestrel Hawk Landfill in Racine, Wisconsin. The Kestrel Hawk Landfill facility accepted the soil as special waste. A copy of the waste characterization soil sample laboratory analytical report is provided in **Appendix A**.

TolTest will utilize a rubber tire loader to load the stockpiled soil into semi-dump trucks. TolTest anticipates that approximately 500 cubic yards of excavated soil will be loaded into semi-dump trucks and transported to the Kestrel Hawk Landfill. The Kestrel Hawk Landfill is a Naval Station Great Lakes-approved landfill.



TolTest will ensure that the semi-dumps utilize the approved entry and exit route as designated by the NTR. Care will be taken to minimize damage to the established vegetation on the golf course.

TolTest and the NTR will coordinate having a Naval Station Great Lakes-approved representative present to sign each manifest. TolTest will provide an example manifest to Mr. Devereaux for review and approval.

Table I-2 Site Restoration

After the excavated soil stockpiles are removed from the site, TolTest will restore the site by placing grass seed and fertilizer on top of the existing topsoil. The NTR will be required to provide TolTest with a specification for the specific mix of grass seed to be used. Once the grass seed and fertilizer is spread on top of the topsoil, TolTest will place erosion blanket over the newly seeded area and secure the erosion blanket to the ground with staples.

Since the restored area is maintained by the golf course grounds keepers, TolTest will not maintain or water the site. However, TolTest will, if needed, re-seed and fertilize areas where the vegetation did not establish a root system.



TABLE I-2 CHEMICAL DATA ACQUISITION

This section identifies the locations and types of chemical data needed, the protocol to be employed to acquire and transport samples to the laboratory, and the quality QA/QC methods to be employed to ensure accurate, precise, representative, and legally defensible data.

TolTest will be responsible for properly sampling and transporting the samples to the analytical laboratory. Samples will be analyzed by Suburban Laboratories, Inc. of Chicago, Illinois. All sampling activities will be performed according to protocols, specific to each parameter of interest, as promulgated by the United States Environmental Protection Agency (USEPA). The Site Superintendent will collect the samples for field screening and laboratory analysis.

The sample analysis for the soil and groundwater samples will be done in accordance the USEPA SW-846 analysis protocols. The method detection limits for analysis will be lower than the TACO standards for Tier 1 Residential and Industrial/Commercial Remediation Objectives from 35 Illinois Administrative Code Part 742, which can be found in **Appendix B. Table I-2** depicts detection limits achievable by the Suburban Laboratories, Inc., Tier 1 required detection limits, and Tier 1 Remediation Objectives.



Table I-2 Screening Objectives

SVOCs EPA Method 8270C	Screening Objectives Mg/kg	SVOCs EPA Method 8270C	Screening Objectives Mg/kg
Acenaphthene	570.0	Hexachlorobenzene	2.0
Anthracene	12,000.0	Hexachloroethane	0.5
Benzo(a)anthracene	2.0	Indeno(1,2,3-c-d)pyrene	14.0
Benzo(b)fluoranthene	2.0	Isophorone	8.0
Benzo(k)fluoranthene	49.0	2-Methylphenol	15.0
Benzo(a)pyrene	8.0	Napthalene	84.0
4-Chloroaniline	0.7	Nitrobenzene	0.1
Chrysene	160.0	N-Nitrosodiphenylamine	1.0
Dibenzo(a,h) anthracene	2.0	N-Nitrosodi-n-propylamine	0.00005
1,2-Dichlorobenzene	17.0	Phenol	100.0
1,4-Dichlorobenzene	2.0	Pyrene	4,200.0
3,3-Dichlorobenzidine	0.007	Benzoic Acid	400.0
Diethyl Phthalate	470.0	2-Chlorophenol	4.0
2,4-Dimethylphenol	9.0	2,4-Dichlorophenol	1.0
2,4-Dinitrotoluene	0.0008	2,4-Dinitrophenol	0.2
2,6-Dinitrotoluene	0.007	Pentachlorophenol	0.03
Fluoranthene	4,300.0	2,4,5-Trichlorophenol	170.0
Fluorene	560.0	2,4,6-Trichlorophenol	0.2



Table I-2 Screening Objectives (continued)

VOCs EPA Method 5035/8260B	Screening Objectives Mg/kg	VOCs EPA Method 5035,8260B	Screening Objectives Mg/kg
Acetone	16.0	1,2-Dichloropropane	0.03
Benzene	0.03	Cis-1,3-Dichloropropene	0.004
Bromodichlormethane	0.6	Ethylbenzene	13.0
Bromoform	0.8	Methylene Chloride	0.02
Carbon Disulfide	32.0	Styrene	4.0
Carbon Tetrachloride	0.07	Tetrachloroethene	0.06
Chlorobenzene	1.0	Toluene	12.0
Chlorodibromomethane	0.4	1,1,1-Trichloroethane	2.0
Chloroform	0.6	1,1,2-Trichloroethane	0.02
1,1-Dichloroethane	23.0	Trichloroethene	0.06
1,2-Dichloroethane	0.02	Vinyl Acetate	170.0
1,1-Dichloroethene	0.06	Vinyl Chloride	0.01
Cis-1,3-Dichloropropene	0.4	Total Xylenes	190.0
Trans-1,3-Dichloropropene	0.7		

RCRA Metals EPA Method 6010	Screening Objectives Mg/L	RCRA Metals EPA Method 6010	Screening Objectives Mg/L
Arsenic	0.05	Lead	0.0075
Barium	2.0	Mercury	0.002
Cadmium	0.005	Selenium	0.05
Chromium	0.1	Silver	0.05

Note: Screening objectives based on Tier 1 Class 1 Residential Objectives

During sampling activities, appropriate decontamination procedures will be followed to minimize sample contamination from external sources such as sampling equipment or sample containers. These procedures will be consistent with those outlined in "Test Methods for Evaluating Solid Waste-Physical/Chemical Methods" (USEPA SW-846, 3rd. ed.).

All samples collected will be preserved according to USEPA protocol established for the parameters of interest. Appropriate measures will be taken to ensure that storage requirements with respect to temperature are maintained during transport to the laboratory and prior to log-in and storage at the laboratory. **Table I-3** contains the container type, volume of sample, preservation of the sample, and holding time for each parameter that may be analyzed.



Table I-3 Sample Collection Information

PARAMETER	CONTAINER	VOLUME	PRESERVATION	HOLDING TIME
VOCs	40-mil Vials	40-mil	Methanol	48 hours
SVOCs and Metals	Teflon-Lined	4oz. Soil	Soil-cool to 4 ⁰ C	14 days

Environmental samples will be transported to the Suburban Laboratories via a next day carrier. Samples will be packaged and transported according to USEPA, Contracting Officer and United States Department of Transportation regulations.

Samples will be collected, transported and received under strict chain-of-custody protocols consistent with procedures established by the USEPA for litigation-related materials. Upon receipt at the laboratory, the laboratory will provide a specific mechanism through which the deposition and custody of the samples are accurately documented during each phase of the analytical process.



5.0 REPORTING REQUIREMENTS

TolTest will provide the NTR a DOCR detailing all work performed, soil assessment, analytical results, site and vicinity maps, photographic documentation, copies of waste manifest, chain-of-custody, and laboratory analytical reports.

The DOCR will discuss the laboratory analytical results as compared to the TACO remediation objectives for residential and commercial properties. As previously stated, the purpose of collecting the soil and water samples is to document that the subsurface soil and groundwater conditions contain SVOCs, VOCs, and RCRA Metal compounds above the TACO residential and commercial remediation objectives. The data obtained from the soil and water samples should not be considered as closure data if the results indicate that the subsurface soil and groundwater conditions are below the TACO remediation objectives.



6.0 SCHEDULE

The work schedule will be eight-hour days, five days per week. The sampling and disposal sequence will begin once the Navy has provided TolTest with a notice to proceed. All work will be completed within 60 days after contract award. A copy of the time line for this DO can be found in **Appendix C**.

The work will be conducted in such a manner as to cause the least interference with the normal functions of the site and surrounding area. Portions of the site will be vacated for periods of time as necessary for TolTest to perform certain work and stage equipment and materials.



PART II - SITE HEALTH AND SAFETY PLAN

1.0 INTRODUCTION

TolTest is responsible for the safety, health, and emergency response provisions for each DO for this contract. These provisions are provided through the development and implementation of TolTest's Corporate Health and Safety plan (HASP) and this Site HASP. All personnel on site, contractors and subcontractors included, will be informed of this plan and any potential health and safety hazards of the operation.



2.0 APPLICABILITY

This plan will be followed during all site activities starting with site mobilization through and including site demobilization. This plan incorporates the requirements of the following regulations and/or appropriate guidance:

- Federal Acquisition Regulation (FAR) clause 52.236-13, Accident Prevention,
- Occupational Safety and Health Administration (OSHA) Construction Industry Standards, 29 Code of Federal Register (CFR) 1926,
- OSHA General Industry Standards, 29 CFR 1910 (including but not limited to 29 CFR 1910.120, Hazardous Waste Site Activities),
- 40 CFR Parts 280, 281, 263-265, and IL Title 35 Section 700 through 750
- 49 CFR Part 178
- OPNAVINST 5090.1B and the base Hazardous Waste Management Plan
- Other applicable Federal, State, and local safety and health requirements.

The implementation of the Work Plan includes the sampling and disposal activities that will be performed at the Willow Glen Golf Course.



3.0 SITE SAFETY AND HEALTH

This section addresses the responsibilities for safety and health oversight, personnel protective equipment, site specific control measures and operating procedures.

3.1 Key Personnel

The Site Safety and Health Officer (SSHO), for this DO, Mr. Tim Boos, has the overall responsibility for ensuring that the provisions of this HASP are implemented in the field. The SSHO will be present during the period that heavy equipment is operating and will observe and record the activities. The SSHO is responsible for conducting daily tailgate safety meetings and site inspections to ensure the effectiveness of this plan. As field conditions change, decisions will be made regarding additional protective measures. Personnel assigned to this project are experienced and meet the supervisory training requirements specified by OSHA in 29 CFR 1910.120 as well as first aid and CPR training. The SSHO is also trained in accordance with the bloodborne pathogen regulation 29 CFR 1910.1300. In the event the SSHO becomes injured or impaired TolTest field personnel can render first aid and CPR.

3.2 Personal Protective Equipment

Personal Protective Equipment (PPE) is to be used by employees for each of the site tasks and operations being performed. The type of PPE will depend upon the level of potential exposure to hazards. Table 1 lists potential chemical hazards of concern. Environmental Protection Agency Level D PPE is anticipated to be used for all tasks for this project. TolTest personnel will be equipped at a minimum with the below mentioned PPE:

- Working Uniform
- Disposable Coveralls (may be used pending site conditions)
- Boots/shoe, steel toe
- Hard hat
- Safety Glasses
- Hearing protection if noise level exceeds 84 dB
- Latex Gloves

3.3 Site Control Measures

Control procedures will be implemented to prevent unauthorized access to the work area. Safety cones and caution tape will be utilized around the work area. The SSHO will ensure that all personnel entering the site have the necessary training and medical approval documentation. Personnel entering the site will be given a thorough briefing on the site hazards and safe work procedures prior to proceeding. This safety meeting will be conducted on a daily basis and will be documented. The topics of discussion will include potential physical and chemical hazards



involved in tank removal activities. The Corporate Health & Safety Manual will be used as a reference to discuss in detail the pertinent topics that are applicable for each days work activities.

All visitors will be expected to comply with applicable regulatory OSHA requirements as well as the requirements of this HASP. Visitors will also be expected to provide their own PPE. In the event that a visitor does not adhere to the provisions of the HASP, they will be requested to leave the work area. All non-conformance incidents will be recorded in the site log. The SSHO will document a written record of all personnel entering and exiting the site.

3.4 Site Standard Operating Safety Procedures

The following safety rules will be adhered to during all site activities:

- At least one copy of this plan will be available at the project site, in a location readily available to all personnel, including visitors.
- Personnel should practice contamination avoidance. All liquid, sludge, and soil samples will be collected in such a manner to minimize contact or exposure to the materials being sampled.
- No food or beverages shall be present or consumed in the work area.
- No tobacco products shall be used on the project site.
- No alcohol or drugs shall be present or consumed on site, or in any company vehicle. No personnel will be permitted to work while under the influence of alcohol or drugs while on site or operating a company vehicle.
- Emergency equipment will be located in the company vehicle in a readily accessible location. Emergency equipment will consist of fire extinguishers, first aid kit, and mobile telephone.
- Visual contact shall be maintained between crew members at all times, and crew members must observe each other for signs of exposure to chemical, biological, or physical agents. Indications of adverse effects include, but are not limited to:
 - Changes in complexion and skin coloration;
 - Changes in coordination;
 - Changes in demeanor;
 - Excessive salivation and pupillary response; and
 - Changes in speech pattern.
- All personnel shall inform their partners or team members of non-visible effects of overexposure to chemical, biological, or physical agents. Symptoms of overexposure may include:
 - Headaches;
 - Dizziness;
 - Nausea;



- Blurred vision;
- Cramps; and
- Irritation of the eyes, skin, or respiratory tract.

3.5 Site-Specific Respiratory Protection

TolTest does not anticipate that respiratory protection will be required for this DO.

3.6 Material Safety Data Sheets

TolTest does not anticipate encountering hazardous materials during the execution of this project, therefore, no Material Safety Data Sheets are provided.



4.0 ACCIDENT PREVENTION

This section includes activity hazard analysis, which describe the work activity, probable hazards related to the work, and proactive precautionary measures that will be taken for safeguarding against and minimizing or eliminating each particular hazard. In addition, daily safety inspections, accident reporting, excavation safety and liquid/soil handling safety are discussed in the following paragraphs.

4.1 Daily Safety Inspections

All machinery and equipment will be inspected daily by the Site Supervisor/ SSHO to ensure a safe operating condition. Inspections will be in accordance with the manufacturer's recommendations and will be documented. Records of inspections will be maintained at the site, will be made available upon request, and will become part of the project file.

In addition to daily inspections, the SSHO will conduct a daily safety meeting. The SSHO will discuss safety topics relevant to the hazards involved in that day's work. All employees and visitors will review and sign the safety-log, which documents the topics of discussion. The safety-log will be submitted to the NTR with the Contractor Quality Control Reports on a weekly basis.

4.2 Accident Reporting

All accident reporting and record keeping requirements will be adhered to. TolTest's forms will be completed for all incidents including personal injury reports, safety incident reports, equipment damage reports, and vehicle accident reports. All reports will be submitted to the Navy representative within 24 hours of any accident. Copies of these forms are included in **Appendix D**.

4.3 Excavation Safety

If excavation work is required, it will be performed in strict conformance with, at a minimum, 29 CFR 1926.650 through 29 CFR 1926.653, including requirements for continuously sloping excavations to 1-1/2 to 1 (33°41') angle of repose, unless TolTest tests the soil.

4.4 Activity Hazard Analysis

Listed below is a description of each task/operation in terms of the definable features associated with the major phase of work. The protective measures to be implemented during completion of those operations are identified in the activity hazard located in **Appendix E**. Activity Hazard Analyses have been developed for:

- Site Walk Through
- Drilling
- Subsurface Soil Sampling
- Backfill and Site Restoration



- Soil Loadout
- Decontamination



5.0 EMERGENCY RESPONSE

TolTest will implement an emergency response and contingency procedures, in accordance with OSHA standards 29 CFR 1910.120(L). This section addresses work zones and excavation procedures, decontamination, emergency medical treatment and first aid, emergency response procedures, spill and discharge control.

5.1 Work Zones and Evacuation Procedures

Daily safety meetings will identify the work zones for construction activities. The three general work zones established at the site are the exclusion zone, contamination reduction zone, and support zone. The exclusion zone is defined as the area where contamination is either known or likely to be present, or because of activity, will provide a potential to cause harm to personnel. Entry into the exclusion zone requires the use of personnel protective equipment. Barricades will surround this zone.

The contamination reduction zone is the area where personnel conduct personal and equipment decontamination. It is essentially a buffer zone between contaminated areas and clean areas. The support zone is situated in clean areas where the chance to encounter hazardous materials or conditions is minimal. Personal protective equipment is therefore not required.

Evacuation routes will be designated during the daily safety meetings. In the event of an emergency, which necessitates evacuation, all personnel will be expected to mobilize a safe distance, using the designated evacuation routes. Personnel will remain at that area until the SSHO provides further instructions.

5.2 Decontamination

All site personnel should minimize contact with contaminants in order to minimize the need for extensive decontamination. The SSHO is responsible for monitoring decontamination procedures and determining their effectiveness. Sampling equipment will be decontaminated by first washing withalconox and water (or equivalent laboratory grade soap) triple rinsing with water and then allowed to air dry. Heavy equipment will be cleaned with a pressurized steam cleaner and detergent upon completion of work activities.

5.3 Emergency Medical Treatment and First Aid

There are no anticipated hazards expected on site, which require specific medical attention or protocols. All TolTest employees participate in TolTest's medical screening and surveillance programs. If an injury/illness or exposure occurs, employees must seek medical attention immediately. All TolTest field personnel are trained in first aid and CPR and can administer immediate assistance.



5.3.1 Cold Stress

Cold and/or wet environmental conditions can place workers at risk of cold-related illness. Hypothermia can occur whenever temperatures are below 45°F. The principal cause of hypothermia in these conditions usually involves the loss of insulating properties of clothing due to moisture; heat loss due to increased air movement, and evaporation of moisture on the skin.

Frostbite, the other illness associated with cold exposure, is the freezing of body tissue which ranges from superficial freezing of surface skin layers to deep freezing of underlying tissue. Frostbite will only occur when the ambient temperatures are below 32°F. The risk of frostbite increases as the temperature drops and the wind speed increases.

Most cold-related worker fatalities have resulted from failure to escape low environmental air temperatures, or from immersion in low temperature water. The single most important aspect of life-threatening hypothermia is a drop in the deep core body temperature.

Site workers should be protected from exposure to cold so that the core body temperature does not fall below 98.6°F. Lower body temperatures will very likely result in reduced mental alertness, reduction in rational decision making, or loss of consciousness with the threat of fatal consequences. To prevent such occurrence, the following measures will be implemented:

- Site workers should wear warm clothing, such as gloves, heavy socks, etc., when the air temperature is below 45°F. Protective clothing, such as Tyvek or other disposable overall, may be used to shield employees from the wind.
- When the air temperature is below 32°F, clothing for warmth should include:
 - Insulated suits, such as whole body thermal underwear
 - Wool socks or polypropylene socks to keep moisture off the feet
 - Insulated gloves
 - Insulated boots
 - Insulated head cover such as hard hat, winter liner, or knit cap
 - Insulated jacket, with wind and water resistant outer layer
- At air temperatures below 32°F, the following work practices must be implemented:
 - If a site worker's underclothing becomes wet, the worker must change into dry clothing immediately. If the clothing becomes wet from sweating (and the employee is uncomfortable), the employee may finish the task at hand prior to changing into dry clothing.
 - Site workers will be provided with a warm (65°F or above) break area.
 - The intake of caffeinated beverages should be limited, due to their circulatory and diuretic effects.



- The buddy system shall be practiced at all times on site. Any site worker observed with severe shivering shall go to the heated break area.
- Site workers should dress in layers, with thinner lighter clothing worn next to the body.

Frostbite.

To administer first aid for frostbite, take the exposed employee indoors and rewarm the areas quickly in warm water that is between 102° and 105°F, for about 20 minutes or until the frozen tissue regains the original color. Provide warm drinks, but no coffee, tea, or alcohol. Keep the affected (frozen) tissue in warm water or covered with warm clothing for 30 minutes, even though the tissue may be very painful as it thaws. If present, do not allow blisters to be broken. Use sterile, soft dry material to cover the injured area, keep the patient warm and get medical attention.

- Do not rub the frostbitten part, additional damage may be done.
- Do not use heat lamps or hot water bottles to warm the frostbitten areas.
- Do not place the exposed part near a hot stove.

Hypothermia.

Hypothermia is defined as a lowering of the core body temperature. General hypothermia, the more life-threatening cold injury, affects the entire body system. Once the body temperature is lowered to 95°F, thermal control is lost, and the body is no longer in thermal balance. A coma may occur when the core temperature reaches to below 95°F. Death can occur within two hours of the first signs and symptoms. The general symptoms of the hypothermia are usually exhibited in five stages:

- Shivering;
- Apathy, listlessness, sleepiness, and (sometimes) rapid cooling of the body;
- Unconsciousness, glassy stare, slow pulse, and respiratory rate;
- Freezing of the extremities; and
- Death.

Extremely low temperatures are not necessary to induce hypothermia--it can occur in temperatures as high as 65°F, depending on the wind chill factor. Wind increases the body's heat loss by dispersing layers of warm air trapped between layers of clothing and skin. This heat loss increases as the wind speed increases.

5.3.2 Heat Stress

Physical hazards may involve heat-related symptoms such as heat stress, heat cramps, heat exhaustion, or heat stroke. Heat stress is the aggregate of environmental and physical work factors that make up the total heat load imposed on the body. The environmental factors of heat stress include air temperature, humidity, radiant heat exchange, and wind/water vapor pressure (related to humidity). Physical work contributes to the total heat stress by producing metabolic heat in the



body, proportional to the intensity of the work. Heavy physical labor can greatly increase the likelihood of heat fatigue, heat exhaustion, and heat stroke, the latter being a life threatening condition. Heat stress monitoring and observation of personnel may commence when the ambient temperature is 80 degrees F or above (65 degrees F, if chemical protective clothing is worn).

All employees will be informed of the possibility and symptoms of heat stress. If an employee experiences extreme fatigue, cramps, dizziness, headache, nausea, profuse sweating, or pale, clammy skin, the employee and the SSHO will take control measures. If the symptoms do not subside after a reasonable rest period, the SSHO shall seek medical assistance.

To prevent heat stress, the following control measures will be implemented.

- Site workers will be encouraged to drink plenty of water throughout the day.
- On-site drinking water will be kept cool to encourage personnel to drink frequently.
- A work regimen that will provide adequate rest periods for cooling down will be established, as required.
- All personnel will be advised of the dangers and symptoms of heat stroke, heat exhaustion, and heat cramps.
- Employees should be instructed to observe and monitor themselves and coworkers for signs of heat stress and to take additional breaks as necessary.
- All breaks should take place in cool, well-ventilated, and shaded rest areas.

Heat Cramps

Heat cramps are caused by heavy sweating and inadequate electrolyte replacement. symptoms include muscle spasms.

Heat Exhaustion

Heat exhaustion occurs from increased stress on various body organs. Signs and symptoms include:

- Pale, cool, moist skin
- Heavy sweating
- Dizziness, nausea
- Fainting

Heat Stroke

Heat stroke is the most serious form of heat stress and should always be treated as a medical emergency. The body's temperature regulation system fails and the body temperature rapidly rises to critical levels. Immediate action must be taken to cool the body before serious injury or death occurs. Signs and symptoms of heat stroke include:



- Red, hot, usually dry skin
- Lack of or reduced respiration
- Nausea
- Dizziness and confusion
- Strong, rapid pulse and confusion
- Coma
- Death

The differential diagnosis for heat stroke is the lack of sweating as the body's defense mechanisms for shedding excess heat fail.

5.4 Emergency Alerting and Response Procedures

All hazardous substance releases or spills involving Government waste or Government property, other than the original release, will be immediately reported to the Department of the Navy. Spill cleanup and remediation and damage to the environment resulting from TolTest actions will be the responsibility of TolTest.

Table II-1 below lists emergency numbers, emergency service organizations and directions to the nearest hospital. Each TolTest employee carries a cell phone.



Table II-1 Emergency Telephone Numbers

Naval Training Center Environmental Office	(847) 688-5999 x161
Navy Hazardous Substance Response Team	(847) 688-3333
Navy Trouble Desk	(847) 688-4820
Great Lakes Police Department, Emergency	(847) 688-3333 or 911
Great Lakes Fire Department, Emergency	(847) 688-3333 or 911
Ambulance Service (Building 200H)	(847) 688-3333 or 911
National Response Center, Coast Guard	(800) 424-8802
CHEMTREC Emergency Response	(800) 424-9300
Environmental Hotline	(847) 688-4197
Provena St. Therese Hospital	(847) 360-2467
Naval Hospital – 2705 Sheridan Road	(847) 688-4560
US Veterans' Medical Center – 3001 Green Bay Road	(847) 688-1900
TolTest Office, Waukegan IL	(847) 689-0697
TolTest Corporate Office, Toledo, OH	(419) 241-7175

Directions to the nearest hospital are provided in **Appendix F**.

5.5 Spill and Discharge Control

This section provides contingency measures for potential spills and discharges from the handling and transportation of any contaminated soil, contamination fluids, and/or oil/fuel. If a spill or discharge occurs, the following actions, at a minimum, will be taken:

1. Notify the Department of the Navy representative immediately.
2. Take immediate measures to control and contain the spill within the site boundaries. This will include, at a minimum, the following actions:
 - Keep unnecessary people away, isolate hazardous areas, and deny entry.
 - Do not allow anyone to touch spilled material.
 - Stay upwind; keep out of low areas where fluids and/or vapors may accumulate.
 - Keep combustibles away from the spilled material.
 - Use water spray or foam to reduce vapor or dust generation, as needed.
 - Take samples for analysis to determine that clean up is adequate.



- Take other corrective measures, as needed.

A written report will be submitted to the Department of the Navy within seven days of a verbal report. The SSHO will conduct spill prevention briefings daily during safety meetings for all personnel who are involved with handling, receipt, storage, and/or cleanup of oil/fuel.

Storage All tanks, containers, and pumping equipment used for the storage or handling of flammable and combustible liquids will be labeled or placarded in accordance with the US DOT. Oils or fuels temporarily stored will be kept in tightly sealed containers (with the exception of proper venting), in fire-resistant areas and at safe distances from ignition sources. All transfer vessels will be emptied at the end of the workday.

Pumping Flammable and Combustible Liquids Flammable liquid pumping systems will be electrically bonded and grounded, and will be drawn from, or transferred into vessels, containers, or tanks through a closed piping system, from safety cans, by means of a device drawing through the top, or from a container, or portable tanks, by gravity or pump, through an approved self closing valve. Transferring by means of air pressure on the container or portable tank is prohibited.

Equipment Inspection Equipment inspection is part of the daily routine during field activities. The Site Supervisor is to ensure that no oil/fuel spill has accumulated in any area by conducting daily visual inspection of the equipment. Equipment and safety issues will be documented in the daily report.



APPENDIX A

WASTE CHARACTERIZATION

SOIL SAMPLE LABORATORY ANALYTICAL REPORT



SUBURBAN LABORATORIES, Inc.

4140 Litt Drive • Hillside, Illinois 60162-1183
Tel. (708) 544-3260 • Toll Free (800) 783-LABS • Fax (708) 544-8587
www.SuburbanLabs.com



October 07, 2003

Jeff Tinney
Toltest Inc.
1000 S. Northpoint Blvd.
Waukegan, IL 600858213
Tel: (847) 689-0697
Fax: (847) 689-0698

Project Name: Golf Course

Workorder #: 03100069

Dear Jeff Tinney,

Suburban Laboratories, Inc. received 2 samples on 10/2/03 1:50:00 PM for the analyses presented in the following report.

There were no problems with the analyses and all the data for the associated QC met EPA, or laboratory specifications except where noted in the case narrative.

This final report of laboratory analysis consists of this cover letter, case narrative, analytical report, dates report, and any accompanying documentation including, but not limited to, chain of custody records, raw data, and letters of explanation or reliance. This report may not be reproduced, except in full, without the prior written approval of Suburban Laboratories, Inc.

If you have any questions regarding these test results, please call your customer service representative at (708) 544-3260.

Sincerely,

Mike Chung
Data Review Manager

CC:



SUBURBAN LABORATORIES, Inc.

4140 Litt Drive · Hillside, Illinois 60162-1183
Tel. (708) 544-3260 · Toll Free (800) 783-LABS · Fax (708) 544-8587
www.SuburbanLabs.com



Client ID: Toltest Inc.
Workorder Name: Golf Course
Workorder #: 03100069
COC #:
Temp Upon Receipt: 6 °C

CASE NARRATIVE

Date: Tuesday, October 07, 2003

PO #:

QC Level: LEVEL I

General Comments:

- All results reported in wet weight unless otherwise indicated. (dry = Dry Weight)
- Sample results relate only to the analytes of interest tested and to sample as received by the laboratory.
- Environmental compliance sample results meet the requirements of Part 186 unless otherwise indicated.
- Accreditation by the State of Illinois is not an endorsement or a guarantee of the validity of data generated. For more information about the laboratories' scope of accreditation, please contact Suburban or the Agency.
- MDL: Method Detection Limit. The minimum concentration of an analyte that can be measured and reported with a 99% confidence that analyte is greater than zero.
- PQL: Practical Quantitation Limit. The lowest concentration that can be reliably achieved within specified requirements of precision and accuracy during routine laboratory operating conditions. The PQL is generally 3 times the MDL.
- DF: Dilution Factor
- <ATC>: Automatic Temperature Correction.

Data Qualifiers:

J: The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

UJ: The analyte was not detected above the reported detection limit. However, the reported limits approximate and may or may not represent the actual limits of detection and quantitation necessary to accurately and precisely measure the analyte in the sample.

I: Result is Invalid; CS: Compound Screened; TNTC: Too Numerous to Count

Method References:

E: USEPA Methods for the Determination of Inorganic Substances in Environmental Samples; Methods for Chemical Analysis of Water and Wastes; Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater, 40CFR136 App A; Methods for the Determination of Metals in Environmental Samples; Methods for the Determination of Organic Compounds in Drinking Water

SW: USEPA, Test Methods for Evaluating Solid Waste, SW-846, 3rd Ed, includes Updates I-III

M: APHA, Standard Methods for the Examination of Water and Wastewater, 18th & 19th Ed.

D: ASTM, Annual Book of Standards F: NAS, Food Chemicals Codex (FCC), 4th Edition

B: US FDA Bacteriological Analytical Manual (BAM) 8th Edition, 1995

USP: US Pharmacopoeia, 24th Revision, 2000

USGS: United States Geological Survey

Project Specific Comments:

Semivolatiles :Sample 03100069-01B;Q = The Internal standard recovery for this analyte in the sample is outside in-house laboratory criteria (no method specific requirement for internal standard recovery on a sample by sample basis)

Samples 03100069-01B and 02B;S=The LCS percent recoveries for the following analytes were outside laboratory control limits:

1,2,4-Trichlorobenzene	4.80%	44-115%
1,4-Dichlorobenzene	22.82%	44-110%
2,4-Dinitrotoluene	24.10%	47-130%
2-Chlorophenol	18.28%	29-107%
4-Chloro-3-methylphenol	24.06%	44-111%
4-Nitrophenol	12.19%	33-173%
N-Nitrosodi-n-propylamine	16.60%	42-149%
Pentachlorophenol	16.21%	36-144%

Client ID: Toltest Inc.
Workorder Name: Golf Course
Workorder #: 03100069

COC #:

Temp Upon Receipt: 6 °C

CASE NARRATIVE

Date: Tuesday, October 07, 2003

PO #:

QC Level: LEVEL I

Phenol 20.15% 39-107%

03100069-02BMS,MSD

Arsenic(As): S=The MS percent recovery (43.03%) and the MSD percent recovery (38.67%)were outside laboratory control limits (70% -130%)

Barium(Ba): S=The MS percent recovery (58.02%) and the MSD percent recovery (154.69%)were outside laboratory control limits (70% -130%)

Cadmium(Cd): S=The MS percent recovery (43.87%) and the MSD percent recovery (39.88%) were outside laboratory control limits (70% -130%).

Chromium(Cr): S=The MS percent recovery (48.34%) and the MSD percent recovery (64.39%)were outside laboratory control limits (70% -130%).

Lead(Pb): S=The MS percent recovery (46.46%) were outside laboratory control limits (70% -130%).

Selenium(Se): S=The MS percent recovery (37.90%) and the MSD percent recovery (31.49%)were outside laboratory control limits (70% -130%).

Silver(Ag): S=The MS percent recovery (34.88%) and the MSD percent recovery (35.07%)were outside laboratory control limits (70% -130%).

Barium(Ba): R=The MS & MSD Precision (33.32%RPD) was greater than laboratory control limits .

Lead(Pb): R=The MS & MSD Precision (33.58% RPD) was greater than laboratory control limits .

**Suburban Laboratories, Inc.**

4140 Litt Drive Hillside, IL 60162 (708) 544-3260

Laboratory Results**Client ID:** Toltest Inc.**Workorder #:** 03100069**Workorder Name:** Golf Course**Date:** Tuesday, October 07, 2003**Lab Sample #:** 03100069-01A
Client Sample ID: SP-01
Matrix: SOIL**Collection Date:** 10/1/03 10:30:00 AM
Received Date: 10/2/03 1:50:00 PM

Analyses	Result	Qual	MDL	PQL	Units	DF	Date Analyzed
COMPOSITE FOR METALS			Method:	COMPOSITE_ME			Analyst: NM
Composite Metals	10/02/03	c	0	0		1	10/2/03 12:00 am
COMPOSITE FOR ORGANICS			Method:	COMPOSITE_OR			Analyst: NM
Composite_OR	10/02/03	c	0	0	Date	1	10/2/03 12:00 am

Qualifiers:MDL-Cautions
Practitioners

ND - Not Detected at the Method Detection Limit

J - Estimated or analyte detected below quantitation limit

B - Analyte detected in the associated Method Blank

* - Value exceeds Maximum Contaminant Level

c - Analyte not included in our scope of accreditation

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

H - Analysis run past method holding time

DF - Dilution Factor

**Suburban Laboratories, Inc.**

4140 Litt Drive Hillside, IL 60162 (708) 544-3260

Laboratory Results

Client ID: Toltest Inc.

Workorder #: 03100069

Workorder Name: Golf Course

Date: Tuesday, October 07, 2003

Lab Sample #: 03100069-01B

Collection Date: 10/1/03 10:30:00 AM

Client Sample ID: SP-01

Received Date: 10/2/03 1:50:00 PM

Matrix: SOIL

Analyses	Result	Qual	MDL	PQL	Units	DF	Date Analyzed
METALS BY ICP							
			Method: SW6010B				Analyst: RA
Arsenic	0.82	J	0.60	1.8	mg/Kg-dry	1	10/7/03 9:56 am
Barium	36.4		0.30	0.90	mg/Kg-dry	1	10/7/03 9:56 am
Cadmium	ND		0.090	0.27	mg/Kg-dry	1	10/7/03 9:56 am
Chromium	11.6		0.30	0.90	mg/Kg-dry	1	10/7/03 9:56 am
Lead	7.70		0.60	1.8	mg/Kg-dry	1	10/7/03 9:56 am
Selenium	ND		0.60	1.8	mg/Kg-dry	1	10/7/03 9:56 am
Silver	ND		0.090	0.27	mg/Kg-dry	1	10/7/03 9:56 am
SEMIVOLATILE ORGANICS (BNAS)							
			Method: SW8270C				Analyst: DP
1,2,4-Trichlorobenzene	ND	S	103	201	µg/Kg-dry	1	10/3/03 6:07 pm
1,2-Dichlorobenzene	ND		189	201	µg/Kg-dry	1	10/3/03 6:07 pm
1,3-Dichlorobenzene	ND		97.5	201	µg/Kg-dry	1	10/3/03 6:07 pm
1,4-Dichlorobenzene	ND	S	88.7	201	µg/Kg-dry	1	10/3/03 6:07 pm
2,4,5-Trichlorophenol	ND		72.6	201	µg/Kg-dry	1	10/3/03 6:07 pm
2,4,6-Trichlorophenol	ND		76.2	201	µg/Kg-dry	1	10/3/03 6:07 pm
2,4-Dichlorophenol	ND		77.4	201	µg/Kg-dry	1	10/3/03 6:07 pm
2,4-Dimethylphenol	ND		89.1	201	µg/Kg-dry	1	10/3/03 6:07 pm
2,4-Dinitrophenol	ND		61.0	201	µg/Kg-dry	1	10/3/03 6:07 pm
2,4-Dinitrotoluene	ND	S	43.3	201	µg/Kg-dry	1	10/3/03 6:07 pm
2,6-Dinitrotoluene	ND		84.6	201	µg/Kg-dry	1	10/3/03 6:07 pm
2-Chloronaphthalene	ND		56.9	201	µg/Kg-dry	1	10/3/03 6:07 pm
2-Chlorophenol	ND	S	199	201	µg/Kg-dry	1	10/3/03 6:07 pm
2-Methylnaphthalene	228		75.8	201	µg/Kg-dry	1	10/3/03 6:07 pm
2-Nitroaniline	ND		38.2	201	µg/Kg-dry	1	10/3/03 6:07 pm
2-Nitrophenol	ND		51.4	201	µg/Kg-dry	1	10/3/03 6:07 pm
3,3-Dichlorobenzidine	ND		70.6	201	µg/Kg-dry	1	10/3/03 6:07 pm
3-Nitroaniline	ND		47.3	201	µg/Kg-dry	1	10/3/03 6:07 pm
4,6-Dinitro-2-methylphenol	ND		43.0	201	µg/Kg-dry	1	10/3/03 6:07 pm
4-Bromophenyl phenyl ether	ND		29.8	201	µg/Kg-dry	1	10/3/03 6:07 pm
4-Chloro-3-methylphenol	ND	S	111	201	µg/Kg-dry	1	10/3/03 6:07 pm
4-Chloroaniline	ND		42.5	201	µg/Kg-dry	1	10/3/03 6:07 pm
4-Chlorophenyl phenyl ether	ND		33.2	201	µg/Kg-dry	1	10/3/03 6:07 pm
4-Nitroaniline	ND		59.8	201	µg/Kg-dry	1	10/3/03 6:07 pm
4-Nitrophenol	ND	S	43.3	201	µg/Kg-dry	1	10/3/03 6:07 pm
Bis(2-chloroethoxy)methane	ND		95.9	201	µg/Kg-dry	1	10/3/03 6:07 pm
Bis(2-chloroethyl)ether	ND		172	201	µg/Kg-dry	1	10/3/03 6:07 pm
Bis(2-chloroisopropyl)ether	ND		172	201	µg/Kg-dry	1	10/3/03 6:07 pm
Bis(2-ethylhexyl)phthalate	203	Q	201	201	µg/Kg-dry	1	10/3/03 6:07 pm
Butyl benzyl phthalate	ND	Q	86.3	201	µg/Kg-dry	1	10/3/03 6:07 pm
Carbazole	ND		201	201	µg/Kg-dry	1	10/3/03 6:07 pm
Di-n-butyl phthalate	ND		96.6	201	µg/Kg-dry	1	10/3/03 6:07 pm

Qualifiers: ND - Not Detected at the Method Detection Limit
 J - Estimated or analyte detected below quantitation limit
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level
 c - Analyte not included in our scope of accreditation

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range
 H - Analysis run past method holding time
 DF - Dilution Factor



Suburban Laboratories, Inc.

4140 Litt Drive Hillside, IL 60162 (708) 544-3260

Laboratory Results

Client ID: Toltest Inc.

Workorder #: 03100069

Workorder Name: Golf Course

Date: Tuesday, October 07, 2003

Di-n-octyl phthalate	ND		54.5	201	µg/Kg-dry	1	10/3/03 6:07 pm
Dibenzofuran	ND		37.3	201	µg/Kg-dry	1	10/3/03 6:07 pm
Diethyl phthalate	ND		45.4	201	µg/Kg-dry	1	10/3/03 6:07 pm
Dimethyl phthalate	ND		60.5	201	µg/Kg-dry	1	10/3/03 6:07 pm
Hexachlorobenzene	ND		43.0	201	µg/Kg-dry	1	10/3/03 6:07 pm
Hexachlorobutadiene	ND		110	201	µg/Kg-dry	1	10/3/03 6:07 pm
Hexachlorocyclopentadiene	ND		99.5	201	µg/Kg-dry	1	10/3/03 6:07 pm
Hexachloroethane	ND		117	201	µg/Kg-dry	1	10/3/03 6:07 pm
Isophorone	ND		51.4	201	µg/Kg-dry	1	10/3/03 6:07 pm
m,p-Cresol	ND		223	402	µg/Kg-dry	1	10/3/03 6:07 pm
N-Nitrosodi-n-propylamine	ND	S	98.3	201	µg/Kg-dry	1	10/3/03 6:07 pm
N-Nitrosodiphenylamine	ND		47.3	201	µg/Kg-dry	1	10/3/03 6:07 pm
Nitrobenzene	ND		129	201	µg/Kg-dry	1	10/3/03 6:07 pm
o-Cresol	ND		68.2	201	µg/Kg-dry	1	10/3/03 6:07 pm
Pentachlorophenol	ND	S	38.1	201	µg/Kg-dry	1	10/3/03 6:07 pm
Phenol	ND	S	46.1	201	µg/Kg-dry	1	10/3/03 6:07 pm
Surr: 2,4,6-Tribromophenol	18.9	S	0	20-117	%REC	1	10/3/03 6:07 pm
Surr: 2-Fluorobiphenyl	30.3	S	0	47-128	%REC	1	10/3/03 6:07 pm
Surr: 2-Fluorophenol	26.2	S	0	41-108	%REC	1	10/3/03 6:07 pm
Surr: 4-Terphenyl-d14	41.3	Q	0	5-131	%REC	1	10/3/03 6:07 pm
Surr: Nitrobenzene-d5	29.0	S	0	32-120	%REC	1	10/3/03 6:07 pm
Surr: Phenol-d5	23.9	S	0	52-116	%REC	1	10/3/03 6:07 pm

SEMIVOLATILE ORGANICS, BY GCMS SIM

Method: SW8270C

Analyst: LA

Acenaphthene	ND		48.1	48.1	µg/Kg-dry	1	10/4/03 5:59 pm
Acenaphthylene	ND		48.1	48.1	µg/Kg-dry	1	10/4/03 5:59 pm
Anthracene	ND		48.1	48.1	µg/Kg-dry	1	10/4/03 5:59 pm
Benzo(a)anthracene	58.9		48.1	48.1	µg/Kg-dry	1	10/4/03 5:59 pm
Benzo(a)pyrene	63.7		48.1	48.1	µg/Kg-dry	1	10/4/03 5:59 pm
Benzo(b)fluoranthene	69.3		48.1	48.1	µg/Kg-dry	1	10/4/03 5:59 pm
Benzo(g,h,i)perylene	54.9		48.1	48.1	µg/Kg-dry	1	10/4/03 5:59 pm
Benzo(k)fluoranthene	55.4		48.1	48.1	µg/Kg-dry	1	10/4/03 5:59 pm
Chrysene	68.7		48.1	48.1	µg/Kg-dry	1	10/4/03 5:59 pm
Dibenzo(a,h)anthracene	ND		48.1	48.1	µg/Kg-dry	1	10/4/03 5:59 pm
Fluoranthene	159		48.1	48.1	µg/Kg-dry	1	10/4/03 5:59 pm
Fluorene	ND		48.1	48.1	µg/Kg-dry	1	10/4/03 5:59 pm
Indeno(1,2,3-cd)pyrene	ND		48.1	48.1	µg/Kg-dry	1	10/4/03 5:59 pm
Naphthalene	ND		48.1	48.1	µg/Kg-dry	1	10/4/03 5:59 pm
Phenanthrene	79.0		48.1	48.1	µg/Kg-dry	1	10/4/03 5:59 pm
Pyrene	111		48.1	48.1	µg/Kg-dry	1	10/4/03 5:59 pm
Surr: 2-Fluorobiphenyl	99.4		0	59.3-135	%REC	1	10/4/03 5:59 pm
Surr: 4-Terphenyl-d14	121		0	51.4-151	%REC	1	10/4/03 5:59 pm
Surr: Nitrobenzene-d5	98.8		0	50.6-126	%REC	1	10/4/03 5:59 pm

MERCURY BY CVAA

Method: SW7471A

Analyst: BK

Mercury	0.351		0.021	0.088	mg/Kg-dry	1	10/6/03 1:19 pm
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PERCENT MOISTURE

Method: D2216

Analyst: BE

Percent Moisture	16.91		0	0	wt%	1	10/2/03 4:15 pm
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Qualifiers: ND - Not Detected at the Method Detection Limit
J - Estimated or analyte detected below quantitation limit
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
c - Analyte not included in our scope of accreditation

S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
H - Analysis run past method holding time
DF - Dilution Factor

**Suburban Laboratories, Inc.**

4140 Litt Drive Hillside, IL 60162 (708) 544-3260

Laboratory Results**Client ID:** Toltest Inc.**Workorder #:** 03100069**Workorder Name:** Golf Course**Date:** Tuesday, October 07, 2003**Lab Sample #:** 03100069-02A**Collection Date:** 10/1/03 11:00:00 AM**Client Sample ID:** SP-02**Received Date:** 10/2/03 1:50:00 PM**Matrix:** SOIL

Analyses	Result	Qual	MDL	PQL	Units	DF	Date Analyzed
COMPOSITE FOR METALS							
Composite Metals	10/02/03	c	Method: COMPOSITE_ME 0	0		1	Analyst: NM 10/2/03 12:00 am
COMPOSITE FOR ORGANICS							
Composite_OR	10/02/03	c	Method: COMPOSITE_OR 0	0	Date	1	Analyst: NM 10/2/03 12:00 am

Qualifiers:MDL-Custom
Fraction(2003)

ND - Not Detected at the Method Detection Limit
J - Estimated or analyte detected below quantitation limit
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
c - Analyte not included in our scope of accreditation

S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
H - Analysis run past method holding time
DF - Dilution Factor



Suburban Laboratories, Inc.

4140 Litt Drive Hillside, IL 60162 (708) 544-3260

Laboratory Results

Client ID: Toltest Inc.

Workorder #: 03100069

Workorder Name: Golf Course

Date: Tuesday, October 07, 2003

Lab Sample #: 03100069-02B

Collection Date: 10/1/03 11:00:00 AM

Client Sample ID: SP-02

Received Date: 10/2/03 1:50:00 PM

Matrix: SOIL

Analyses	Result	Qual	MDL	PQL	Units	DF	Date Analyzed
METALS BY ICP							
			Method: SW6010B				Analyst: RA
Arsenic	1.3	SJ	0.64	1.9	mg/Kg-dry	1	10/7/03 10:03 am
Barium	59.0	RS	0.32	0.96	mg/Kg-dry	1	10/7/03 10:03 am
Cadmium	ND	S	0.096	0.29	mg/Kg-dry	1	10/7/03 10:03 am
Chromium	16.5	S	0.32	0.96	mg/Kg-dry	1	10/7/03 10:03 am
Lead	35.2	RS	0.64	1.9	mg/Kg-dry	1	10/7/03 10:03 am
Selenium	ND	S	0.64	1.9	mg/Kg-dry	1	10/7/03 10:03 am
Silver	ND	S	0.096	0.29	mg/Kg-dry	1	10/7/03 10:03 am
SEMIVOLATILE ORGANICS (BNAS)							
			Method: SW8270C				Analyst: DP
1,2,4-Trichlorobenzene	ND	S	109	214	µg/Kg-dry	1	10/3/03 6:45 pm
1,2-Dichlorobenzene	ND		201	214	µg/Kg-dry	1	10/3/03 6:45 pm
1,3-Dichlorobenzene	ND		104	214	µg/Kg-dry	1	10/3/03 6:45 pm
1,4-Dichlorobenzene	ND	S	94.6	214	µg/Kg-dry	1	10/3/03 6:45 pm
2,4,5-Trichlorophenol	ND		77.4	214	µg/Kg-dry	1	10/3/03 6:45 pm
2,4,6-Trichlorophenol	ND		81.2	214	µg/Kg-dry	1	10/3/03 6:45 pm
2,4-Dichlorophenol	ND		82.5	214	µg/Kg-dry	1	10/3/03 6:45 pm
2,4-Dimethylphenol	ND		95.0	214	µg/Kg-dry	1	10/3/03 6:45 pm
2,4-Dinitrophenol	ND		65.1	214	µg/Kg-dry	1	10/3/03 6:45 pm
2,4-Dinitrotoluene	ND	S	46.2	214	µg/Kg-dry	1	10/3/03 6:45 pm
2,6-Dinitrotoluene	ND		90.2	214	µg/Kg-dry	1	10/3/03 6:45 pm
2-Chloronaphthalene	ND		60.7	214	µg/Kg-dry	1	10/3/03 6:45 pm
2-Chlorophenol	ND	S	212	214	µg/Kg-dry	1	10/3/03 6:45 pm
2-Methylnaphthalene	ND		80.8	214	µg/Kg-dry	1	10/3/03 6:45 pm
2-Nitroaniline	ND		40.7	214	µg/Kg-dry	1	10/3/03 6:45 pm
2-Nitrophenol	ND		54.8	214	µg/Kg-dry	1	10/3/03 6:45 pm
3,3-Dichlorobenzidine	ND		75.3	214	µg/Kg-dry	1	10/3/03 6:45 pm
3-Nitroaniline	ND		50.4	214	µg/Kg-dry	1	10/3/03 6:45 pm
4,6-Dinitro-2-methylphenol	ND		45.8	214	µg/Kg-dry	1	10/3/03 6:45 pm
4-Bromophenyl phenyl ether	ND		31.8	214	µg/Kg-dry	1	10/3/03 6:45 pm
4-Chloro-3-methylphenol	ND	S	118	214	µg/Kg-dry	1	10/3/03 6:45 pm
4-Chloroaniline	ND		45.3	214	µg/Kg-dry	1	10/3/03 6:45 pm
4-Chlorophenyl phenyl ether	ND		35.4	214	µg/Kg-dry	1	10/3/03 6:45 pm
4-Nitroaniline	ND		63.8	214	µg/Kg-dry	1	10/3/03 6:45 pm
4-Nitrophenol	ND	S	46.2	214	µg/Kg-dry	1	10/3/03 6:45 pm
Bis(2-chloroethoxy)methane	ND		102	214	µg/Kg-dry	1	10/3/03 6:45 pm
Bis(2-chloroethyl)ether	ND		184	214	µg/Kg-dry	1	10/3/03 6:45 pm
Bis(2-chloroisopropyl)ether	ND		184	214	µg/Kg-dry	1	10/3/03 6:45 pm
Bis(2-ethylhexyl)phthalate	ND		214	214	µg/Kg-dry	1	10/3/03 6:45 pm
Butyl benzyl phthalate	ND		92.0	214	µg/Kg-dry	1	10/3/03 6:45 pm
Carbazole	241		214	214	µg/Kg-dry	1	10/3/03 6:45 pm
Di-n-butyl phthalate	ND		103	214	µg/Kg-dry	1	10/3/03 6:45 pm

Qualifiers: ND - Not Detected at the Method Detection Limit

S - Spike Recovery outside accepted recovery limits

MDL-Certified
Practices 2001

J - Estimated or analyte detected below quantitation limit

R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank

E - Value above quantitation range

* - Value exceeds Maximum Contaminant Level

H - Analysis run past method holding time

c - Analyte not included in our scope of accreditation

DF - Dilution Factor



Suburban Laboratories, Inc.

4140 Litt Drive Hillside, IL 60162 (708) 544-3260

Laboratory Results

Client ID: Toltest Inc.

Workorder #: 03100069

Workorder Name: Golf Course

Date: Tuesday, October 07, 2003

Di-n-octyl phthalate	ND	58.1	214	µg/Kg-dry	1	10/3/03 6:45 pm
Dibenzofuran	249	39.8	214	µg/Kg-dry	1	10/3/03 6:45 pm
Diethyl phthalate	ND	48.4	214	µg/Kg-dry	1	10/3/03 6:45 pm
Dimethyl phthalate	ND	64.6	214	µg/Kg-dry	1	10/3/03 6:45 pm
Hexachlorobenzene	ND	45.8	214	µg/Kg-dry	1	10/3/03 6:45 pm
Hexachlorobutadiene	ND	117	214	µg/Kg-dry	1	10/3/03 6:45 pm
Hexachlorocyclopentadiene	ND	106	214	µg/Kg-dry	1	10/3/03 6:45 pm
Hexachloroethane	ND	124	214	µg/Kg-dry	1	10/3/03 6:45 pm
Isophorone	ND	54.8	214	µg/Kg-dry	1	10/3/03 6:45 pm
m,p-Cresol	ND	237	429	µg/Kg-dry	1	10/3/03 6:45 pm
N-Nitrosodi-n-propylamine	ND	105	214	µg/Kg-dry	1	10/3/03 6:45 pm
N-Nitrosodiphenylamine	ND	50.4	214	µg/Kg-dry	1	10/3/03 6:45 pm
Nitrobenzene	ND	137	214	µg/Kg-dry	1	10/3/03 6:45 pm
o-Cresol	ND	70.6	214	µg/Kg-dry	1	10/3/03 6:45 pm
Pentachlorophenol	ND	38.5	214	µg/Kg-dry	1	10/3/03 6:45 pm
Phenol	ND	49.2	214	µg/Kg-dry	1	10/3/03 6:45 pm
Surr: 2,4,6-Tribromophenol	19.1	S	0	20-117	%REC	1 10/3/03 6:45 pm
Surr: 2-Fluorobiphenyl	26.5	S	0	47-128	%REC	1 10/3/03 6:45 pm
Surr: 2-Fluorophenol	23.5	S	0	41-108	%REC	1 10/3/03 6:45 pm
Surr: 4-Terphenyl-d14	35.7		0	5-131	%REC	1 10/3/03 6:45 pm
Surr: Nitrobenzene-d5	28.2	S	0	32-120	%REC	1 10/3/03 6:45 pm
Surr: Phenol-d5	21.9	S	0	52-116	%REC	1 10/3/03 6:45 pm

SEMIVOLATILE ORGANICS, BY GCMS SIM

Method: SW8270C

Analyst: LA

Acenaphthene	ND	51.4	51.4	µg/Kg-dry	1	10/4/03 6:37 pm
Acenaphthylene	ND	51.4	51.4	µg/Kg-dry	1	10/4/03 6:37 pm
Anthracene	ND	51.4	51.4	µg/Kg-dry	1	10/4/03 6:37 pm
Benzo(a)anthracene	ND	51.4	51.4	µg/Kg-dry	1	10/4/03 6:37 pm
Benzo(a)pyrene	ND	51.4	51.4	µg/Kg-dry	1	10/4/03 6:37 pm
Benzo(b)fluoranthene	51.4	51.4	51.4	µg/Kg-dry	1	10/4/03 6:37 pm
Benzo(g,h,i)perylene	ND	51.4	51.4	µg/Kg-dry	1	10/4/03 6:37 pm
Benzo(k)fluoranthene	ND	51.4	51.4	µg/Kg-dry	1	10/4/03 6:37 pm
Chrysene	ND	51.4	51.4	µg/Kg-dry	1	10/4/03 6:37 pm
Dibenzo(a,h)anthracene	ND	51.4	51.4	µg/Kg-dry	1	10/4/03 6:37 pm
Fluoranthene	90.6	51.4	51.4	µg/Kg-dry	1	10/4/03 6:37 pm
Fluorene	ND	51.4	51.4	µg/Kg-dry	1	10/4/03 6:37 pm
Indeno(1,2,3-cd)pyrene	ND	51.4	51.4	µg/Kg-dry	1	10/4/03 6:37 pm
Naphthalene	ND	51.4	51.4	µg/Kg-dry	1	10/4/03 6:37 pm
Phenanthrene	ND	51.4	51.4	µg/Kg-dry	1	10/4/03 6:37 pm
Pyrene	65.2	51.4	51.4	µg/Kg-dry	1	10/4/03 6:37 pm
Surr: 2-Fluorobiphenyl	98.6	0	59.3-135	%REC	1	10/4/03 6:37 pm
Surr: 4-Terphenyl-d14	127	0	51.4-151	%REC	1	10/4/03 6:37 pm
Surr: Nitrobenzene-d5	92.4	0	50.6-126	%REC	1	10/4/03 6:37 pm

MERCURY BY CVAA

Method: SW7471A

Analyst: BK

Mercury	1.79	0.026	0.11	mg/Kg-dry	1	10/6/03 1:19 pm
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PERCENT MOISTURE

Method: D2216

Analyst: BE

Percent Moisture	22.18	0	0	wt%	1	10/2/03 4:15 pm
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Qualifiers: ND - Not Detected at the Method Detection Limit
J - Estimated or analyte detected below quantitation limit
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
c - Analyte not included in our scope of accreditation

S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
H - Analysis run past method holding time
DF - Dilution Factor

**SUBURBAN LABORATORIES, Inc.**

4140 Litt Drive Hillside, Illinois 60162 (708) 544-3260

PREP DATES REPORT**Client ID:** Toltest Inc.**Workorder #:** 03100069**Project Name:** Golf Course**Date:** Tuesday, October 07, 2003

Lab Sample ID	Collection Date	Batch #	Prep Method	Prep Name	Prep Date
03100069-01B	10/1/03 10:30 am	10300	SW7471A	Mercury Prep for Solids	10/3/03 12:51 pm
	10/1/03 10:30 am	10295	SW3550B	SOLID PREP SONICATION: BNA	10/3/03 11:34 am
	10/1/03 10:30 am	10296	SW3550B	SOLID PREP SONICATION: BNA	10/3/03 11:34 am
	10/1/03 10:30 am	10288	SW3050A	SOLID PREP TOTAL METALS: ICP	10/2/03 6:21 pm
03100069-02B	10/1/03 11:00 am	10300	SW7471A	Mercury Prep for Solids	10/3/03 12:51 pm
	10/1/03 11:00 am	10295	SW3550B	SOLID PREP SONICATION: BNA	10/3/03 11:34 am
	10/1/03 11:00 am	10296	SW3550B	SOLID PREP SONICATION: BNA	10/3/03 11:34 am
	10/1/03 11:00 am	10288	SW3050A	SOLID PREP TOTAL METALS: ICP	10/2/03 6:21 pm

#

Tel:708.544.3260 Fax:708.544.8587 Toll Free:800.783.LABSEmail:Info@SuburbanLabs.com

Rev. 6/5/01

White-Original(Returnwithreport),Yellow-LabCopy,Pink-SamplerCopy



APPENDIX B

TACO STANDARDS

Section 742.APPENDIX B: Tier 1 Tables and Illustrations

Section 742.TABLE A: Tier 1 Soil Remediation Objectives^a for Residential Properties

CAS No.	Chemical Name	Exposure Route-Specific Values for Soils		Soil Component of the Groundwater Ingestion Exposure Route Values		ADL (mg/kg)
		Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/kg)	Class II (mg/kg)	
83-32-9	Acenaphthene	4,700 ^b	--- ^c	570 ^b	2,900	*
67-64-1	Acetone	7,800 ^b	100,000 ^d	16 ^b	16	*
15972-60-8	Alachlor ^o	8 ^c	--- ^c	0.04	0.2	NA
116-06-3	Aldicarb ^o	78 ^b	--- ^c	0.013	0.07	NA
309-00-2	Aldrin	0.04 ^c	3 ^c	0.5 ^c	2.5	*
120-12-7	Anthracene	23,000 ^b	--- ^c	12,000 ^b	59,000	*
1912-24-9	Atrazine ^o	2700 ^b	--- ^c	0.066	0.33	NA
71-43-2	Benzene	22 ^c	0.8 ^c	0.03	0.17	*
56-55-3	Benzo(a)anthracene	0.9 ^c	--- ^c	2	8	*
205-99-2	Benzo(b)fluoranthene	0.9 ^c	--- ^c	5	25	*

		Exposure Route-Specific Values for Soils		Soil Component of the Groundwater Ingestion Exposure Route Values		
CAS No.	Chemical Name	Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/kg)	Class II (mg/kg)	ADL (mg/kg)
207-08-9	Benzo(<i>k</i>)fluoranthene	9 ^e	--- ^c	49	250	*
50-32-8	Benzo(<i>a</i>)pyrene	0.09 ^{e,f}	--- ^c	8	82	*
111-44-4	Bis(2-chloroethyl)ether	0.6 ^e	0.2 ^{e,f}	0.0004 ^{e,f}	0.0004	0.66
117-81-7	Bis(2-ethylhexyl)phthalate	46 ^e	31,000 ^d	3,600	31,000 ^d	*
75-27-4	Bromodichloromethane (Dichlorobromomethane)	10 ^e	3,000 ^d	0.6	0.6	*
75-25-2	Bromoform	81 ^e	53 ^e	0.8	0.8	*
71-36-3	Butanol	7,800 ^b	10,000 ^d	17 ^b	17	NA
85-68-7	Butyl benzyl phthalate	16,000 ^b	930 ^d	930 ^d	930 ^d	*
86-74-8	Carbazole	32 ^e	--- ^c	0.6 ^e	2.8	NA
1563-66-2	Carbofuran ^o	390 ^b	--- ^c	0.22	1.1	NA
75-15-0	Carbon disulfide	7,800 ^b	720 ^d	32 ^b	160	*

CAS No.	Chemical Name	Exposure Route-Specific Values for Soils		Soil Component of the Groundwater Ingestion Exposure Route Values		ADL (mg/kg)
		Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/kg)	Class II (mg/kg)	
56-23-5	Carbon tetrachloride	5 ^c	0.3 ^c	0.07	0.33	*
57-74-9	Chlordane	0.5 ^c	20 ^c	10	48	*
106-47-8	4-Chloroaniline (<i>p</i> -Chloroaniline)	310 ^b	--- ^c	0.7 ^b	0.7	1.3
108-90-7	Chlorobenzene (Monochlorobenzene)	1,600 ^b	130 ^b	1	6.5	*
124-48-1	Chlorodibromomethane (Dibromochloromethane)	1,600 ^b	1,300 ^d	0.4	0.4	*
67-66-3	Chloroform	100 ^c	0.3 ^c	0.6	2.9	*
218-01-9	Chrysene	88 ^c	--- ^c	160	800	*
94-75-7	2,4-D	780 ^b	--- ^c	1.5	7.7	*
75-99-0	Dalapon	2,300 ^b	--- ^c	0.85	8.5	1.2
72-54-8	DDD	3 ^c	--- ^c	16 ^c	80	*
72-55-9	DDE	2 ^c	--- ^c	54 ^c	270	*

		Exposure Route-Specific Values for Soils		Soil Component of the Groundwater Ingestion Exposure Route Values		
CAS No.	Chemical Name	Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/kg)	Class II (mg/kg)	ADL (mg/kg)
50-29-3	DDT	2 ^e	--- ^g	32 ^e	160	*
53-70-3	Dibenzo(<i>a,h</i>)anthracene	0.09 ^{e,f}	--- ^c	2	7.6	*
96-12-8	1,2-Dibromo-3-chloropropane	0.46 ^e	11 ^b	0.002	0.002	*
106-93-4	1,2-Dibromoethane (Ethylene dibromide)	0.0075 ^e	0.17 ^e	0.0004	0.004	0.005
84-74-2	Di- <i>n</i> -butyl phthalate	7,800 ^b	2,300 ^d	2,300 ^d	2,300 ^d	*
95-50-1	1,2-Dichlorobenzene (<i>o</i> - Dichlorobenzene)	7,000 ^b	560 ^d	17	43	*
106-46-7	1,4-Dichlorobenzene (<i>p</i> - Dichlorobenzene)	--- ^c	--- ^g	2	11	*
91-94-1	3,3'-Dichlorobenzidine	1 ^e	--- ^c	0.007 ^{e,f}	0.033	1.3
75-34-3	1,1-Dichloroethane	7,800 ^b	1,300 ^b	23 ^b	110	*

CAS No.	Chemical Name	Exposure Route-Specific Values for Soils		Soil Component of the Groundwater Ingestion Exposure Route Values		ADL (mg/kg)
		Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/kg)	Class II (mg/kg)	
107-06-2	1,2-Dichloroethane (Ethylene dichloride)	7 ^e	0.4 ^e	0.02	0.1	*
75-35-4	1,1-Dichloroethylene	700 ^b	1,500 ^d	0.06	0.3	*
156-59-2	<i>cis</i> -1,2-Dichloroethylene	780 ^b	1,200 ^d	0.4	1.1	*
156-60-5	<i>trans</i> -1,2-Dichloroethylene	1,600 ^b	3,100 ^d	0.7	3.4	*
78-87-5	1,2-Dichloropropane	9 ^e	15 ^b	0.03	0.15	*
542-75-6	1,3-Dichloropropene (1,3-Dichloropropylene, <i>cis</i> + <i>trans</i>)	4 ^e	0.1 ^e	0.004 ^e	0.02	0.005
60-57-1	Dieldrin ⁿ	0.04 ^e	1 ^e	0.004 ^e	0.02	*
84-66-2	Diethyl phthalate	63,000 ^b	2,000 ^d	470 ^b	470	*
105-67-9	2,4-Dimethylphenol	1,600 ^b	--- ^c	9 ^b	9	*
121-14-2	2,4-Dinitrotoluene	0.9 ^e	--- ^c	0.0008 ^{e,f}	0.0008	0.013

		Exposure Route-Specific Values for Soils		Soil Component of the Groundwater Ingestion Exposure Route Values		
CAS No.	Chemical Name	Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/kg)	Class II (mg/kg)	ADL (mg/kg)
606-20-2	2,6-Dinitrotoluene	0.9 ^e	--- ^c	0.0007 ^{e,f}	0.0007	0.0067
117-84-0	Di- <i>n</i> -octyl phthalate	1,600 ^b	10,000 ^d	10,000 ^d	10,000 ^d	*
115-29-7	Endosulfan	470 ^b	--- ^c	18 ^b	90	*
145-73-3	Endothall ^o	1,600 ^b	--- ^c	0.4	0.4	NA
72-20-8	Endrin	23 ^b	--- ^c	1	5	*
100-41-4	Ethylbenzene	7,800 ^b	400 ^d	13	19	*
206-44-0	Fluoranthene	3,100 ^b	--- ^c	4,300 ^b	21,000	*
86-73-7	Fluorene	3,100 ^b	--- ^c	560 ^b	2,800	*
76-44-8	Heptachlor	0.1 ^e	0.1 ^e	23	110	*
1024-57-3	Heptachlor epoxide	0.07 ^e	5 ^e	0.7	3.3	*
118-74-1	Hexachlorobenzene	0.4 ^e	1 ^e	2	11	*
319-84-6	<i>alpha</i> -HCH (<i>alpha</i> -BHC)	0.1 ^e	0.8 ^e	0.0005 ^{e,f}	0.003	0.002

CAS No.	Chemical Name	Exposure Route-Specific Values for Soils		Soil Component of the Groundwater Ingestion Exposure Route Values		ADL (mg/kg)
		Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/kg)	Class II (mg/kg)	
58-89-9	<i>gamma</i> -HCH (Lindane) ⁿ	0.5 ^e	--- ^c	0.009	0.047	*
77-47-4	Hexachlorocyclopentadiene	550 ^b	10 ^b	400	2,200 ^d	*
67-72-1	Hexachloroethane	78 ^b	--- ^c	0.5 ^b	2.6	*
193-39-5	Indeno(1,2,3- <i>c,d</i>)pyrene	0.9 ^e	--- ^c	14	69	*
78-59-1	Isophorone	15,600 ^b	4,600 ^d	8 ^b	8	*
72-43-5	Methoxychlor	390 ^b	--- ^c	160	780	*
74-83-9	Methyl bromide (Bromomethane)	110 ^b	10 ^b	0.2 ^b	1.2	*
75-09-2	Methylene chloride (Dichloromethane)	85 ^e	13 ^e	0.02 ^e	0.2	*
95-48-7	2-Methylphenol (<i>o</i> - Cresol)	3,900 ^b	--- ^c	15 ^b	15	*
91-20-3	Naphthalene	3,100 ^b	--- ^c	84 ^b	420	*
98-95-3	Nitrobenzene	39 ^b	92 ^b	0.1 ^{b,f}	0.1	0.26

CAS No.	Chemical Name	Exposure Route-Specific Values for Soils		Soil Component of the Groundwater Ingestion Exposure Route Values		ADL (mg/kg)
		Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/kg)	Class II (mg/kg)	
86-30-6	<i>N</i> -Nitrosodiphenylamine	130 ^e	--- ^c	1 ^e	5.6	*
621-64-7	<i>N</i> -Nitrosodi- <i>n</i> -propylamine	0.09 ^{e,f}	--- ^c	0.00005 ^{e,f}	0.00005	0.66
108-95-2	Phenol	47,000 ^b	--- ^c	100 ^b	100	*
1918-02-1	Picloram ^o	5,500 ^b	--- ^c	2	20	NA
1336-36-3	Polychlorinated biphenyls (PCBs) ⁿ	1; 10 ^h	--- ^{c,h}	--- ^h	--- ^h	*
129-00-0	Pyrene	2,300 ^b	--- ^c	4,200 ^b	21,000	*
122-34-9	Simazine ^o	390 ^b	--- ^c	0.04	0.37	NA
100-42-5	Styrene	16,000 ^b	1,500 ^d	4	18	*
127-18-4	Tetrachloroethylene (Perchloroethylene)	12 ^e	11 ^e	0.06	0.3	*
108-88-3	Toluene	16,000 ^b	650 ^d	12	29	*

CAS No.	Chemical Name	Exposure Route-Specific Values for Soils		Soil Component of the Groundwater Ingestion Exposure Route Values		ADL (mg/kg)
		Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/kg)	Class II (mg/kg)	
8001-35-2	Toxaphene ⁿ	0.6 ^c	89 ^c	31	150	*
120-82-1	1,2,4-Trichlorobenzene	780 ^b	3,200 ^b	5	53	*
71-55-6	1,1,1-Trichloroethane	--- ^c	1,200 ^d	2	9.6	*
79-00-5	1,1,2-Trichloroethane	310 ^b	1,800 ^d	0.02	0.3	*
79-01-6	Trichloroethylene	58 ^c	5 ^c	0.06	0.3	*
108-05-4	Vinyl acetate	78,000 ^b	1,000 ^b	170 ^b	170	*
75-01-4	Vinyl chloride	0.3 ^c	0.03 ^c	0.01 ^f	0.07	*
108-38-3	m-Xylene	160,000 ^b	420 ^d	210	210	*
95-47-6	o-Xylene	160,000 ^b	410 ^d	190	190	*
106-42-3	p-Xylene	160,000 ^b	460 ^d	200	200	*

CAS No.	Chemical Name	Exposure Route-Specific Values for Soils		Soil Component of the Groundwater Ingestion Exposure Route Values		ADL (mg/kg)
		Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/kg)	Class II (mg/kg)	
1330-20-7	Xylenes (total)	160,000 ^b	410 ^d	150	150	*
	Ionizable Organics					
65-85-0	Benzoic Acid	310,000 ^b	--- ^c	400 ^{b,i}	400 ⁱ	*
95-57-8	2-Chlorophenol	390 ^b	53,000 ^d	4 ^{b,i}	4 ⁱ	*
120-83-2	2,4-Dichlorophenol	230 ^b	--- ^c	1 ^{b,i}	1 ⁱ	*
51-28-5	2,4-Dinitrophenol	160 ^b	--- ^c	0.2 ^{b,f}	0.2	3.3
88-85-7	Dinoseb ^o	78 ^b	--- ^c	0.34 ^{b,i}	3.4 ⁱ	*
87-86-5	Pentachlorophenol	3 ^{e,j}	--- ^c	0.03 ^{f,i}	0.14 ⁱ	2.4
93-72-1	2,4,5-TP (Silvex)	630 ^b	--- ^c	11 ⁱ	55 ⁱ	*
95-95-4	2,4,5-Trichlorophenol	7,800 ^b	--- ^c	270 ^{b,i}	1,400 ⁱ	*
88-06-2	2,4,6 Trichlorophenol	58 ^e	200 ^e	0.2 ^{e,f,i}	0.77 ⁱ	0.43

CAS No.	Chemical Name	Exposure Route-specific Values for Soils		Soil Component of the Groundwater Ingestion Exposure Route Values		ADL (mg/kg)
		Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/L)	Class II (mg/L)	
	Inorganics					
7440-36-0	Antimony	31 ^b	--- ^c	0.006 ^m	0.024 ^m	*
7440-38-2	Arsenic ^{l,n}	0.4 ^{e,t}	750 ^e	0.05 ^m	0.2 ^m	*
7440-39-3	Barium	5,500 ^b	690,000 ^b	2.0 ^m	2.0 ^m	*
7440-41-7	Beryllium	0.1 ^{e,t}	1,300 ^e	0.004 ^m	0.5 ^m	*
7440-42-8	Boron	7,000 ^b	--- ^g	2.0 ^m	2.0 ^m	*
7440-43-9	Cadmium ^{l,n}	78 ^{b,r}	1,800 ^e	0.005 ^m	0.05 ^m	*
16887-00-6	Chloride	--- ^c	--- ^c	200 ^m	200 ^m	*
7440-47-3	Chromium, total	390 ^b	270 ^e	0.1 ^m	1.0 ^m	*
16065-83-1	Chromium, ion, trivalent	78,000 ^b	--- ^c	--- ^g	--- ^g	*
18540-29-9	Chromium, ion, hexavalent	390 ^b	270 ^e	---	---	*
7440-48-4	Cobalt	4,700 ^b	--- ^c	1.0 ^m	1.0 ^m	*

CAS No.	Chemical Name	Exposure Route-specific Values for Soils		Soil Component of the Groundwater Ingestion Exposure Route Values		ADL (mg/kg)
		Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/L)	Class II (mg/L)	
7440-50-8	Copper ⁿ	2,900 ^b	--- ^c	0.65 ^m	0.65 ^m	*
57-12-5	Cyanide (amenable)	1,600 ^b	--- ^c	0.2 ^q	0.6 ^q	*
7782-41-4	Fluoride	4,700 ^b	--- ^c	4.0 ^m	4.0 ^m	*
15438-31-0	Iron	--- ^c	--- ^c	5.0 ^m	5.0 ^m	*
7439-92-1	Lead	400 ^k	--- ^c	0.0075 ^m	0.1 ^m	*
7439-96-5	Manganese	3,700 ^b	69,000 ^b	0.15 ^m	10.0 ^m	*
7439-97-6	Mercury ^{l,n}	23 ^{b,s}	10 ^{b,i}	0.002 ^m	0.01 ^m	*
7440-02-0	Nickel ^l	1,600 ^b	13,000 ^c	0.1 ^m	2.0 ^m	*
14797-55-8	Nitrate as N ^p	130,000 ^b	--- ^c	10.0 ^q	100 ^q	*
7782-49-2	Selenium ^{l,n}	390 ^b	--- ^c	0.05 ^m	0.05 ^m	*

CAS No.	Chemical Name	Exposure Route-specific Values for Soils		Soil Component of the Groundwater Ingestion Exposure Route Values		ADL (mg/kg)
		Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/L)	Class II (mg/L)	
7440-22-4	Silver	390 ^b	--- ^c	0.05 ^m	---	*
14808-79-8	Sulfate	--- ^c	--- ^c	400 ^m	400 ^m	*
7440-28-0	Thallium	6.3 ^{b,u}	--- ^c	0.002 ^m	0.02 ^m	*
7440-62-2	Vanadium	550 ^b	--- ^c	0.049 ^m	---	*
7440-66-6	Zinc ¹	23,000 ^b	--- ^c	5.0 ^m	10 ^m	*

"*" indicates that the ADL is less than or equal to the specified remediation objective.
 NA means not available; no PQL or EQL available in USEPA analytical methods.

Chemical Name and Soil Remediation Objective Notations

- ^a Soil remediation objectives based on human health criteria only.
- ^b Calculated values correspond to a target hazard quotient of 1.
- ^c No toxicity criteria available for the route of exposure.
- ^d Soil saturation concentration ($C_{(sat)}$) = the concentration at which the absorptive limits of the soil particles, the solubility limits of the available soil moisture, and saturation of soil pore air have been reached. Above the soil saturation concentration, the assumptions regarding vapor transport to air and/or dissolved phase transport to groundwater (for chemicals which are liquid at ambient soil temperatures) have been violated, and alternative modeling approaches are required.
- ^e Calculated values correspond to a cancer risk level of 1 in 1,000,000.
- ^f Level is at or below Contract Laboratory Program required quantitation limit for Regular Analytical Services (RAS).
- ^g Chemical-specific properties are such that this route is not of concern at any soil contaminant concentration.
- ^h A preliminary goal of 1 ppm has been set for PCBs based on *Guidance on Remedial Actions for Superfund Sites with PCB Contamination*, EPA/540G-90/007, and on USEPA efforts to manage PCB contamination. See 40 CFR 761.120 - USEPA "PCB Spill Cleanup Policy." This regulation goes on to say that the remediation goal for an unrestricted area is 10 ppm and 25 ppm for a restricted area, provided both have at least 10 inches of clean cover.
- ⁱ Soil remediation objective for pH of 6.8. If soil pH is other than 6.8, refer to Appendix B, Tables C and D of this Part.
- ^j Ingestion soil remediation objective adjusted by a factor of 0.5 to account for dermal route.
- ^k A preliminary remediation goal of 400 mg/kg has been set for lead based on *Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities*, OSWER Directive #9355.4-12.
- ^l Potential for soil-plant-human exposure.
- ^m The person conducting the remediation has the option to use: 1) TCLP or SPLP test results to compare with the remediation objectives listed in this Table; or 2) the total amount of contaminant in the soil sample results to compare with pH specific remediation objectives listed in Appendix B, Table C or D of this Part. (See Section 742.510.) If the person conducting the remediation wishes to calculate soil remediation objectives based on background concentrations, this should be done in accordance with Subpart D of this Part.
- ⁿ The Agency reserves the right to evaluate the potential for remaining contaminant concentrations to pose significant threats to crops, livestock, or wildlife.
- ^o For agrichemical facilities, remediation objectives for surficial soils which are based on field application rates may be more appropriate for currently registered pesticides. Consult the Agency for further information.
- ^p For agrichemical facilities, soil remediation objectives based on site-specific background concentrations of Nitrate as N may be more appropriate. Such determinations shall be conducted in accordance with the procedures set forth in Subparts D and I of this Part.
- ^q The TCLP extraction must be done using water at a pH of 7.0.
- ^r Value based on dietary Reference Dose.
- ^s Value based on Reference Dose for Mercuric chloride (CAS No. 7487-94-7).
- ^t Note that Table value is likely to be less than background concentration for this chemical; screening or remediation concentrations using the procedures of Subpart D of this Part may be more appropriate.
- ^u Value based on Reference Dose for thallium sulfate (CAS No. 7446-18-6).

Section 742.APPENDIX B: Tier 1 Tables and Illustrations

Section 742.TABLE E: Tier 1 Groundwater Remediation Objectives for the Groundwater Component of the Groundwater Ingestion Route

CAS No.	Chemical Name	Groundwater Remediation Objective	
		Class I (mg/L)	Class II (mg/L)
83-32-9	Acenaphthene	0.42	2.1
67-64-1	Acetone	0.7	0.7
15972-60-8	Alachlor	0.002 ^c	0.01 ^c
116-06-3	Aldicarb	0.003 ^c	0.015 ^c
309-00-2	Aldrin	0.00004 ^a	0.0002
120-12-7	Anthracene	2.1	10.5
1912-24-9	Atrazine	0.003 ^c	0.015 ^c
71-43-2	Benzene	0.005 ^c	0.025 ^c
56-55-3	Benzo(a)anthracene	0.00013 ^a	0.00065
205-99-2	Benzo(b)fluoranthene	0.00018 ^a	0.0009
207-08-9	Benzo(k)fluoroanthene	0.00017 ^a	0.00085
50-32-8	Benzo(a)pyrene	0.0002 ^{a,c}	0.002 ^c
111-44-4	Bis(2-chloroethyl)ether	0.01 ^a	0.01
117-81-7	Bis(2-ethylhexyl)phthalate	0.006 ^{a,c}	0.06 ^c
75-27-4	Bromodichloromethane (Dichlorobromomethane)	0.00002 ^a	0.00002
75-25-2	Bromoform	0.0002 ^a	0.0002
71-36-3	Butanol	0.7	0.7
85-68-7	Butyl benzyl phthalate	1.4	7.0
86-74-8	Carbazole	---	---
1563-66-2	Carbofuran	0.04 ^c	0.2 ^c
75-15-0	Carbon disulfide	0.7	3.5
56-23-5	Carbon tetrachloride	0.005 ^c	0.025 ^c
57-74-9	Chlordane	0.002 ^c	0.01 ^c

CAS No.	Chemical Name	Groundwater Remediation Objective	
		Class I (mg/L)	Class II (mg/L)
108-90-7	Chlorobenzene (Monochlorobenzene)	0.1 ^c	0.5 ^c
124-48-1	Chlorodibromomethane (Dibromochloromethane)	0.14	0.14
67-66-3	Chloroform	0.00002 ^a	0.0001
218-01-9	Chrysene	0.0015 ^a	0.0075
94-75-7	2,4-D	0.07 ^c	0.35 ^c
75-99-0	Dalapon	0.2 ^c	2.0 ^c
72-54-8	DDD	0.00011 ^a	0.00055
72-55-9	DDE	0.00004 ^a	0.0002
50-29-3	DDT	0.00012 ^a	0.0006
53-70-3	Dibenzo(<i>a,h</i>)anthracene	0.0003 ^a	0.0015
96-12-8	1,2-Dibromo-3-chloropropane	0.0002 ^c	0.0002 ^c
106-93-4	1,2-Dibromoethane (Ethylene dibromide)	0.00005 ^{a,c}	0.0005 ^c
84-74-2	Di- <i>n</i> -butyl phthalate	0.7	3.5
95-50-1	1,2-Dichlorobenzene (<i>o</i> - Dichlorobenzene)	0.6 ^c	1.5 ^c
106-46-7	1,4-Dichlorobenzene (<i>p</i> - Dichlorobenzene)	0.075 ^c	0.375 ^c
91-94-1	3,3'-Dichlorobenzidine	0.02 ^a	0.1
75-34-3	1,1-Dichloroethane	0.7	3.5
107-06-2	1,2-Dichloroethane (Ethylene dichloride)	0.005 ^c	0.025 ^c
75-35-4	1,1-Dichloroethylene ^b	0.007 ^c	0.035 ^c
156-59-2	<i>cis</i> -1,2-Dichloroethylene	0.07 ^c	0.2 ^c
156-60-5	<i>trans</i> -1,2-Dichloroethylene	0.1 ^c	0.5 ^c
78-87-5	1,2-Dichloropropane	0.005 ^c	0.025 ^c
542-75-6	1,3-Dichloropropene (1,3-Dichloropropylene, <i>cis</i> + <i>trans</i>)	0.001 ^a	0.005

CAS No.	Chemical Name	Groundwater Remediation Objective	
		Class I (mg/L)	Class II (mg/L)
60-57-1	Dieldrin	0.00002 ^a	0.0001
84-66-2	Diethyl phthalate	5.6	5.6
121-14-2	2,4-Dinitrotoluene ^a	0.00002	0.00002
606-20-2	2,6-Dinitrotoluene ^a	0.0001	0.0001
88-85-7	Dinoseb	0.007 ^c	0.07 ^c
117-84-0	Di- <i>n</i> -octyl phthalate	0.14	0.7
115-29-7	Endosulfan	0.042	0.21
145-73-3	Endothall	0.1 ^c	0.1 ^c
72-20-8	Endrin	0.002 ^c	0.01 ^c
100-41-4	Ethylbenzene	0.7 ^c	1.0 ^c
206-44-0	Fluoranthene	0.28	1.4
86-73-7	Fluorene	0.28	1.4
76-44-8	Heptachlor	0.0004 ^c	0.002 ^c
1024-57-3	Heptachlor epoxide	0.0002 ^c	0.001 ^c
118-74-1	Hexachlorobenzene	0.00006 ^a	0.0003
319-84-6	<i>alpha</i> -HCH (<i>alpha</i> -BHC)	0.00003 ^a	0.00015
58-89-9	<i>gamma</i> -HCH (Lindane)	0.0002 ^c	0.001 ^c
77-47-4	Hexachlorocyclopentadiene	0.05 ^c	0.5 ^c
67-72-1	Hexachloroethane	0.007	0.035
193-39-5	Indeno(1,2,3- <i>c,d</i>)pyrene	0.00043 ^a	0.00215
78-59-1	Isophorone	1.4	1.4
72-43-5	Methoxychlor	0.04 ^c	0.2 ^c
74-83-9	Methyl bromide (Bromomethane)	0.0098	0.049
75-09-2	Methylene chloride (Dichloromethane)	0.005 ^c	0.05 ^c
91-20-3	Naphthalene ²	0.025	0.039
98-95-3	Nitrobenzene ²	0.0035	0.0035

		Groundwater Remediation Objective	
CAS No.	Chemical Name	Class I (mg/L)	Class II (mg/L)
1918-02-1	Picloram	0.5°	5.0°
1336-36-3	Polychlorinated biphenyls (PCBs) ^a	0.0005°	0.0025°
129-00-0	Pyrene	0.21	1.05
122-34-9	Simazine	0.004°	0.04°
100-42-5	Styrene	0.1°	0.5°
93-72-1	2,4,5-TP (Silvex)	0.05°	0.25°
127-18-4	Tetrachloroethylene (Perchloroethylene)	0.005°	0.025°
108-88-3	Toluene	1.0°	2.5°
8001-35-2	Toxaphene	0.003°	0.015°
120-82-1	1,2,4-Trichlorobenzene	0.07°	0.7°
71-55-6	1,1,1-Trichloroethane ²	0.2°	1.0°
79-00-5	1,1,2-Trichloroethane	0.005°	0.05°
79-01-6	Trichloroethylene	0.005°	0.025°
108-05-4	Vinyl acetate	7.0	7.0
75-01-4	Vinyl chloride	0.002°	0.01°
1330-20-7	Xylenes (total)	10.0°	10.0°
	Ionizable Organics		
65-85-0	Benzoic Acid	28	28
106-47-8	4-Chloroaniline (<i>p</i> -Chloroaniline)	0.028	0.028
95-57-8	2-Chlorophenol	0.035	0.175
120-83-2	2,4-Dichlorophenol	0.021	0.021
105-67-9	2,4-Dimethylphenol	0.14	0.14
51-28-5	2,4-Dinitrophenol	0.014	0.014
95-48-7	2-Methylphenol (<i>o</i> - Cresol)	0.35	0.35
86-30-6	<i>N</i> -Nitrosodiphenylamine	0.01 ^a	0.05

CAS No.	Chemical Name	Groundwater Remediation Objective	
		Class I (mg/L)	Class II (mg/L)
621-64-7	<i>N</i> -Nitrosodi- <i>n</i> -propylamine	0.01 ^a	0.01
87-86-5	Pentachlorophenol	0.001 ^{a,c}	0.005 ^c
108-95-2	Phenol	0.1 ^c	0.1 ^c
95-95-4	2,4,5-Trichlorophenol	0.7	3.5
88-06-2	2,4,6 Trichlorophenol	0.0064 ^a	0.032
	Inorganics		
7440-36-0	Antimony	0.006 ^c	0.024 ^c
7440-38-2	Arsenic	0.05 ^c	0.2 ^c
7440-39-3	Barium	2.0 ^c	2.0 ^c
7440-41-7	Beryllium	0.004 ^c	0.5 ^c
7440-42-8	Boron	2.0 ^c	2.0 ^c
7440-43-9	Cadmium	0.005 ^c	0.05 ^c
16887-00-6	Chloride	200 ^c	200 ^c
7440-47-3	Chromium, total	0.1 ^c	1.0 ^c
18540-29-9	Chromium, ion, hexavalent	—	—
7440-48-4	Cobalt	1.0 ^c	1.0 ^c
7440-50-8	Copper	0.65 ^c	0.65 ^c
57-12-5	Cyanide	0.2 ^c	0.6 ^c
7782-41-4	Fluoride	4.0 ^c	4.0 ^c
15438-31-0	Iron	5.0 ^c	5.0 ^c
7439-92-1	Lead	0.0075 ^c	0.1 ^c
7439-96-5	Manganese	0.15 ^c	10.0 ^c
7439-97-6	Mercury	0.002 ^c	0.01 ^c
7440-02-0	Nickel	0.1 ^c	2.0 ^c
14797-55-8	Nitrate as N	10.0 ^c	100 ^c
7782-49-2	Selenium	0.05 ^c	0.05 ^c
7440-22-4	Silver	0.05 ^c	—
14808-79-8	Sulfate	400 ^c	400 ^c

CAS No.	Chemical Name	Groundwater Remediation Objective	
		Class I (mg/L)	Class II (mg/L)
7440-28-0	Thallium	0.002 ^a	0.02 ^c
7440-62-2	Vanadium ²	0.049	—
7440-66-6	Zinc	5.0 ^a	10 ^c

Chemical Name and Groundwater Remediation Objective Notations

- ^a The groundwater Health Advisory concentration is equal to ADL for carcinogens.
- ^b Oral Reference Dose and/or Reference Concentration under review by USEPA. Listed values subject to change.
- ^c Value listed is also the Groundwater Quality Standard for this chemical pursuant to 35 Ill. Adm. Code 620.410 for Class I Groundwater or 35 Ill. Adm. Code 620.420 for Class II Groundwater.






APPENDIX C

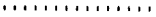


TIME LINE

ID	Task Name	Start	Finish	Predecessors	Oct 19, '03							Oct 26, '03							Nov 2, '03							Nov 9, '03							Nov 16, '03									
					T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T		
1	Pre-Execution Phase	Thu 10/16/03	Mon 10/27/03																																							
2	Submit Draft Work Plan/HA	Thu 10/16/03	Thu 10/16/03																																							
3	Navy Review	Thu 10/16/03	Wed 10/22/03																																							
4	Submit Final Work Plan/HA	Wed 10/22/03	Mon 10/27/03																																							
5	Execution Phase	Mon 10/27/03	Fri 10/31/03																																							
6	Collect Disposal Samples	Mon 10/27/03	Fri 10/31/03																																							
7	Collect Soil and Water Sa	Mon 10/27/03	Fri 10/31/03																																							
8	Load and Transport Soil	Mon 10/27/03	Wed 10/29/03																																							
9	Site Restoration	Wed 10/29/03	Thu 10/30/03																																							
10	Post Execution Phase	Mon 11/10/03	Thu 11/20/03																																							
11	Submit Draft DOCR	Mon 11/10/03	Mon 11/10/03																																							
12	Navy Review	Mon 11/10/03	Fri 11/14/03																																							
13	Submit Final DOCR	Fri 11/14/03	Thu 11/20/03																																							

Project: Willow Glen Golf Course
Date 10-16-03

Task 
Split 
Progress 

Milestone 
Summary 
Rolled Up Task 

Rolled Up Split 
Rolled Up Milestone 
Rolled Up Progress 

External Tasks 
Project Summary 



APPENDIX D

INCIDENT REPORTS

ATTACHMENT 2 ASSOCIATE INJURY REPORT

This report is to be initiated by the associate's supervisor. Please answer all questions completely. This report must be forwarded to the Manager, Corporate Health and Safety within 24 hours of the injury/illness.

ASSOCIATE

Injured's Name _____ Sex _____ SSN _____ Birth Date _____
Home Address _____
City _____ State _____ Zip _____ Phone () _____
Job Title _____ Hire Date _____ Hourly Wage _____
Date of Incident _____ Time _____ Time Reported _____ To Whom? _____
Project/Department Name _____ Address _____
Project No _____ Time Shift Began _____ Did Associate Leave Work? ☐ No ☐ Yes When? _____
Has associate returned to work? ☐ No ☐ Yes When _____ Did associate miss a regularly scheduled shift? ☐ No ☐ Yes
Doctor/Hospital Name _____ Address _____
Witness Name(s) _____ Statement Attached? ☐ No ☐ Yes
Nature of Injury _____ Exact Body Part _____
Medical Attention: ☐ None ☐ First Aid On Site ☐ Doctor's Office ☐ Hospital ER ☐ Hospitalized
Job Assignment at Time of Incident _____
Describe Incident _____

Associate: _____
Print Signature Date

Comments on Incident and Corrective Action(s) _____

SUPERVISOR

What Unsafe Condition(s) and/or Act(s) Contributed to the Incident? _____

What Corrective Action(s) Have Been Taken to Prevent Recurrence? _____

Supervisor: _____
Print Signature Date

ASSOCIATE INJURY REPORT

CONTINUED

Manager, Corporate Health and Safety

Concur With Action Taken? ☐ Yes ☐ No Remarks _____

OSHA Classification: ☐ First Aid ☐ Recordable, No Lost/Restricted Workdays

☐ Recordable, Lost Workdays ☐ Recordable, Restricted Activity ☐ Fatality

Days Away From Work _____

Days Restricted Work _____

Worker's Compensation Claim Number (if applicable) _____

To/ Test Tracking No. _____

Verbal Received (Date/Time) _____

Report Received (Date/Time) _____

Drug Screen ☐ Yes ☐ No Alcohol Screen ☐ Yes ☐ No

Manager, Corporate Health and Safety:

Print _____

Signature _____

Date _____

A. Type of Injury or Illness Code: _____

E. Agent Code: _____

B. Injured Body Part Code: _____

F. Safety Rule Violated Code: _____

C. Activity at Time of Incident Code: _____

G. Incident Prevention Code: _____

D. Cause Code: _____

H. Instruction/RE-Instruction Code: _____

ATTACHMENT 3

GENERAL LIABILITY, PROPERTY DAMAGE AND LOSS REPORT

This report is to be completed for all losses or damage to company property in excess of \$1000 and all third party damage, regardless of value, resulting from company activities.

Project/Department/Location _____ Project No. _____ Date _____
Address _____
How Did Damage or Loss Occur: _____

Description and Value (\$) of Damaged/Lost/Stolen Property: _____

Location of Damaged/Lost/Stolen Property (Before Loss): _____

Date and Time of Damage, Loss or Theft: _____

Owner of Damaged/Lost/Stolen Property:

Name _____ Phone No. () _____
Address _____ City _____
Employer and Address _____

Injured Parties (Also completed a Supervisor's Associate Injury Report if a Company Associate):

Name _____ Phone No. () _____
Address _____ City _____
Employer and Address _____
Description of Injury _____

Witnesses:

1. Name _____ Phone No. () _____
Address _____ City _____
Employer and Address _____
2. Name _____ Phone No. () _____
Address _____ City _____
Employer and Address _____

Were Pictures Taken? ☐ Yes ☐ No
Were Police Notified? ☐ Yes ☐ No Dept _____ Report No. _____

Completed By:

Print Signature Date
Manager, Corporate Health and Safety:

Print Signature Date

ATTACHMENT 4 INCIDENT INVESTIGATION REPORT

*** MUST BE COMPLETED WITHIN 72 HOURS ***

Investigation Date _____ Date of Incident _____

Employee Name _____

Supervisor Name _____

Dept. Name/Project Number/Project Name _____

Location of Incident _____

Incident Classification

- Injury ☐ First Aid Vehicle ☐ Chargeable DOT ☐ DOT Vehicle
☐ OSHA Recordable ☐ Non-Chargeable ☐ DOT Reportable
☐ Lost Workday ☐ Restricted Workday Near Miss ☐ General Liability ☐

- Description (Provide facts, describe how incident occurred, provide diagram [on back] or photos)

- Analysis 1 (What unsafe acts or conditions contributed to the incident?)

- Analysis 2 (What systematic or management deficiencies contributed to incident?)

- Corrective Action(s) (List corrective action items, responsible person, scheduled completion date)

- Witnesses (Attach statements or indicate why unavailable)

Investigated By _____
Print Signature Date

Manager, Corp. _____
Health and Safety Print Signature Date

ATTACHMENT 5
INCIDENT REVIEW BOARD

DATE:		LOCATION:	
BOARD MEMBERS.			
INCIDENT DATE:		ASSOCIATE(S) INVOLVED IN INCIDENT:	
INVESTIGATION COMPLETE:		YES <input type="checkbox"/>	INCIDENT CLASSIFICATION
NO <input type="checkbox"/>			
THE FOLLOWING INFORMATION <u>MUST</u> BE PROVIDED BY THE REVIEW BOARD FOR THIS INCIDENT (PRINT)			
SUPERVISOR: _____			
CAUSE OF INCIDENT:			
ACTION(S) RECOMMENDED BY BOARD*:			
*ALL ACTIONS BY THE INCIDENT REVIEW BOARD ARE SUBJECT TO FINAL REVIEW BY THE INDIVIDUALS LISTED BELOW.			
ACCEPTED:			
_____ ASSOCIATE SIGNATURE		_____ SUPERVISOR SIGNATURE	
ACCEPTED:		REJECTED FOR:	
_____ MANAGER, CORPORATE HEALTH AND SAFETY		_____ _____	
ACCEPTED:		REJECTED FOR:	
_____ MANAGER, HUMAN RESOURCES		_____ _____	
ACCEPTED:		REJECTED FOR:	
_____ DIVISION VICE PRESIDENT		_____ _____	

ATTACHMENT 6 VEHICLE INCIDENT REPORT

This report is to be initiated by the associate involved in the incident or his/her direct supervisor. Please answer all questions completely. This report must be forwarded to the Manager, Corporate Health and Safety within 24 hours of the incident.

INCIDENT DESCRIPTION

INCIDENT DATE _____ TIME _____ A.M. or P.M.
LOCATION OF INCIDENT (ADDRESS, CITY AND STATE) _____
DESCRIPTION OF INCIDENT _____

WITNESS _____ PHONE NO. () _____
ADDRESS _____ CITY _____ STATE _____ ZIP _____
POLICE OFFICER'S NAME _____ DEPARTMENT _____

COMPANY VEHICLE

DRIVER _____ DRIVER'S LICENSE _____ STATE _____
ADDRESS _____ CITY _____ STATE _____ ZIP _____
WORK PHONE NO () _____ SSN _____ PROJECT NAME/NO _____ OFFICE/DEPT _____
VEHICLE NO _____ YEAR _____ MAKE _____ MODEL _____ LICENSE PLATE NO _____
STATE _____ VEHICLE OWNER _____ COMPANY _____ LEASED/RENTED _____ PRIVATE VEHICLE _____
VEHICLE TYPE _____ COMMERCIAL MOTOR VEHICLE _____ NON COMMERCIAL _____
IF NOT COMPANY-OWNED: OWNER _____ PHONE NO () _____
ADDRESS _____ CITY _____ STATE _____ ZIP _____
VEHICLE DAMAGE _____
NO. OF VEHICLES TOWED FROM SCENE _____ NUMBER OF INJURIES _____ NUMBER OF FATALITIES _____
WERE HAZARDOUS MATERIALS RELEASED? _____ YES _____ NO IF YES, DESCRIBE MATERIALS _____

OTHER VEHICLE

DRIVER _____ DRIVER'S LICENSE _____ STATE _____
ADDRESS _____ CITY _____ STATE _____ ZIP _____
PHONE NO () _____ SSN _____
OWNER'S NAME (CHECK IF SAME AS DRIVER) _____
ADDRESS _____ CITY _____ STATE _____ ZIP _____
INSURANCE COMPANY _____ POLICY NO _____
ADDRESS _____ CITY _____ STATE _____ ZIP _____
VEHICLE: YEAR _____ MAKE _____ MODEL _____ PLATE NO _____ STATE _____
VEHICLE IDENTIFICATION NUMBER _____
VEHICLE DAMAGE _____
PASSENGERS YES NO INJURIES YES (List names and telephone numbers below) NO

WEATHER _____ CLEAR _____ CLOUDY _____ FOG _____ RAIN _____
_____ SLEET _____ SNOW _____ OTHER _____
PAVEMENT _____ ASPHALT _____ STEEL _____ CONCRETE _____ WOOD _____
_____ GRAVEL/DIRT _____ BRICK/STONE _____ OTHER _____
CONDITION _____ DRY _____ WET _____ ICY _____ POTHOLES _____
_____ OTHER _____
TRAFFIC CONTROL _____ TRAFFIC LIGHT _____ STOP SIGN _____ RAILROAD _____
_____ NO INTERSECTION _____ NO CONTROL _____

VEHICLE INCIDENT REPORT (continued)

ROADWAY _____ NUMBER OF LANES EACH DIRECTION _____ RESIDENTIAL _____
_____ DIVIDED HIGHWAY _____ UNDIVIDED HIGHWAY _____

Draw and name roadways showing each vehicle, direction of travel, and point of impact. Indicate travel direction before the incident with a solid line and post-incident movement with a broken line.

SYMBOLS:

Your Vehicle

①

Other Vehicle(s)

②

Pedestrian

③



Stop Sign



Yield



Railroad



ADDITIONAL INFORMATION: _____

ASSOCIATE

(Print)

(Signature)

(Date)

SUPERVISOR

(Print)

(Signature)

(Date)

DEPARTMENT SAFETY REPRESENTATIVE

(Print)

(Signature)

(Date)

CORPORATE HEALTH & SAFETY MNGR

(Print)

(Signature)

(Date)

TRACKING # _____

HEALTH & SAFETY DEPARTMENT

INCIDENT REPORT ORDERED

AT FAULT

Y N

ORIGINAL. _____ H&S FILE

D&A SCREEN

DEFENSIVE DRIVING

Y N

CC. _____ ASSOCIATE _____ DEPT. SAFETY REP _____ W/C FILE _____ DENISE



APPENDIX E

ACTIVITY HAZARD ANALYSES



ACTIVITY HAZARD ANALYSIS

ACTIVITY Site Walk ANALYZED BY/DATE K. Helman 10/03 REVIEWED BY/DATE J. Tinney 10/03

PRINCIPAL STEPS	POTENTIAL HAZARDS	RECOMMENDED CONTROLS
Site walk through Identification of work zones for construction activities	1 Exposure to irritant and toxic plants such as poison ivy and sticker bushes may cause allergic reactions 2. Surfaces covered with heavy vegetation and undergrowth create a tripping hazard. 3 Back strain due to carrying instruments. 4 Native wildlife such as rodents, ticks, and snakes present the possibility of insect bites and associated diseases such as Lyme disease. 5 Driving vehicles on uneven or unsafe surfaces can result in accidents such as overturned vehicles or flat tires. 6. Electrical hazard due to fallen lines 7. Thermal stress due to hot/cold temperature extremes.	1 Wear long sleeved clothing and slacks to minimize contact with irritant and toxic plants and to protect against insect bites. Appropriate first aid for personnel's known allergic reactions 2. Be alert and observe terrain while walking to minimize slips and falls Steel-toed boots provide additional support and stability. 3 Use proper lifting techniques to prevent back strain 4 Avoid wildlife when possible. In case of an animal bite, perform first aid and capture the animal, if possible, for rabies testing Perform a tick check after leaving a wooded or vegetated area. 5. Ensure all maintenance is performed on vehicles before going to the field Site surveillance on foot might be required to choose clear driving paths. 6. Ensure fallen power lines are not energized 7 Implement thermal stress management techniques such as shifting work hours, fluid intake, and monitoring employees, especially high risk
EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
		1. Review hazard analysis with personnel performing the site walk through prior to start



ACTIVITY HAZARD ANALYSIS

ACTIVITY Soil Excavation ANALYZED BY/DATE K. Helman 10/98 REVIEWED BY/DATE J. Tinney 01/01

PRINCIPAL STEPS	POTENTIAL HAZARDS	RECOMMENDED CONTROLS
Excavation	1 Exposure to airborne contaminants released during intrusive activities 2 Sides of excavation can cave in. Possible burying or crushing of workers due to 1) absence of shoring, 2) misjudgment of stability, 3) defective shoring, and/or 4) undercut sides. 3. Falling during access/egress or while monitoring or dismounting equipment, or stumbling into excavation. 4. Congested work area due to too many workers in a small area 5 Existing utilities	1. Monitor for airborne contaminants 2. Regularly inspect trenches for conditions. 3. Provide adequate shoring or sloping of sides of the excavation Solid rock, cemented sand or gravel = 90 degrees Compact angular gravel = 63 degrees 26 ft. Compacted sharp sand = 33 degrees 41 ft. deep Rounded loose sand = 26 degrees 34 ft deep 4. Provide an adequate barrier around open pits. Material from pit must be placed away from edge to prevent cave ins and instability of pit 5. To prevent overexertion, limit manual lifting and emphasize mechanical means where practical. 6. <i>Maintain ample workroom between workers.</i> 7. Find and mark utilities before excavating utilizing the Joint Utility Locating Information for Excavators (JULIE) service 72 hours prior to excavation activities. Use care while excavating, shore existing utilities crossing excavation area Watch for overhead lines. 8. Check the performance of JULIE locate prior to digging.
EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
1 Backhoe	Daily, prior to use per manufactures recommendations, Fill our Safety Inspection Checklist	OSHA 1910.120 40-hr training, 3 day OJT, 8 hr. Supervisory, 8 hr refresher, OSHA Hazard Communication, Respirator and operator training
2 Rolloff Boxes	Use of assistive climbing equipment when covering or placing tarp on box	

[illegible]

[illegible]

[illegible]



ACTIVITY HAZARD ANALYSIS

ACTIVITY Subsurface Soil Sampling ANALYZED BY/DATE K. Helman 10/03 REVIEWED BY/DATE J. Tinney 10/03

PRINCIPAL STEPS	POTENTIAL HAZARDS	RECOMMENDED CONTROLS
Subsurface Soil Sampling	1. Dermal contact with or inhalation of contaminants, potentially in high concentrations in sampling media. 2. Back strain and muscle fatigue due to lifting, shoveling and auguring techniques. 3. Dermal contact with or inhalation of decontamination solutions.	1. To minimize exposure to chemical contaminants, a thorough review of suspected contaminants shall be completed and implementation of an adequate protection program. 2. PPE shall include level D consisting of work uniform, steel toe boots/shoes, hard hat, safety glasses, hearing protection (when levels exceed 85 dbs) and tyvek suit (may not be needed depending on site conditions) 3. Proper lifting (pre-lift weight assessment, use of legs, multiple personnel) techniques will prevent back strain. Use slow easy motions when shoveling, auguring, and digging to decrease muscle strain. 4. Material Safety Data Sheets for all decontamination solutions shall be included with the Site Health and Safety Plan 5. First aid equipment shall be available based on MSDS requirements
EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
Soil sampling tools		OSHA 1910.120 40-hr. training, 3 day OJT, 8 hr Supervisory, 8 hr refresher, OSHA Hazard Communication, and Respirator training. Knowledge and training on collection of environmental samples



ACTIVITY HAZARD ANALYSIS

ACTIVITY Backfill & Site Restoration ANALYZED BY/DATE K. Helman 10/98 REVIEWED BY/DATE J. Tinney 01/01

PRINCIPAL STEPS	POTENTIAL HAZARDS	RECOMMENDED CONTROLS
Backfill excavation Compact backfill Seed area	1 Noise levels exceeding the OSHA PEL of 90 dBA are both a hazard and a hindrance to communication 2. Carbon monoxide from the heavy equipment 3. Overhead utility wires, i.e., electrical and telephone, can be hazardous when the dump truck bed is in the upright position. 4 Falling backfill material from dump truck may cause injury 5 Moving the equipment over uneven terrain may cause the vehicle to roll over or get stuck in a rut or mud Be aware of hazards associated with moving heavy machinery and other associated injury. 6 High-pressure hydraulic lines and airlines used on heavy equipment are hazardous when they are in ill repair or incorrectly assembled	1 Ear muffs or earplugs effectively reduce noise levels 2. Review the contaminants suspected to be on-site and perform air monitoring as required. Shut down equipment and/or divert exhaust fumes. 3. All chains, lines, cables shall be inspected daily for weak spots. 4. Hard hats shall be worn at all times when working around heavy equipment 5. Secure loose clothing 6 To avoid contact with any overhead lines, the truck bed shall be lowered prior to moving the truck Overhead utilities shall be considered "live" until determined otherwise. 7 The truck bed should not be erected within 10 feet of an overhead electrical line until the line is de-energized, grounded, or shielded and an electrician has certified that arcing cannot occur. 8. All high-pressure lines shall be checked prior to and during use.
EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
1. Backhoe	Daily, prior to use per manufactures recommendations, Fill our Safety Inspection Checklist	OSHA 1910.120 40-hr training, 3 day OJT, 8 hr. Supervisory, 8 hr refresher, OSHA Hazard Communication, Respirator and operator training



ACTIVITY HAZARD ANALYSIS

ACTIVITY Soil Loadout REVIEWED BY/DATE K. Helman 10/98 REVIEWED BY / DATE J. Tinney 01/01

Error! Bookmark not defined. PRINCIPAL STEPS	POTENTIAL HAZARDS	RECOMMENDED CONTROLS
Loadout Soil & Site Grading	1. Noise levels exceeding 85 dbs are both a hazard and a hindrance to communication. 2. Carbon monoxide from the heavy equipment 3. Overhead utilities. 4. Falling backfill material from backhoe may cause injury. 5. Moving the equipment over uneven terrain may cause the vehicle to roll over or get stuck 6. High-pressure hydraulic lines and airlines used on heavy equipment are hazardous when they are in ill repair or incorrectly assembled	1 Ear muffs or earplugs effectively reduce noise levels 2. Review the contaminants suspected to be on-site and perform air monitoring as required. Shut down equipment and/or divert exhaust fumes 3 All chains, lines, cables should be inspected daily for weak spots. 4. Hard hats should be worn at all times when working around a heavy equipment. 5 Secure loose clothing 6. Overhead utilities should be considered "live" until determined otherwise. 7 Be aware of hazards associated with moving heavy equipment 8 All high-pressure lines should be checked prior to and during use
EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
1 Backhoe	Daily, prior to use per manufactures recommendations, Fill our Safety Inspection Checklist	OSHA 1910.120 40-hr training, 3 day OJT, 8 hr. Supervisory, 8 hr refresher, OSHA Hazard Communication, Respirator and operator training
2. Loader	Daily, prior to use per manufactures recommendations, Fill our Safety Inspection Checklist	OSHA 1910 120 40-hr. training, 3 day OJT, 8 hr Supervisory, 8 hr. refresher, OSHA Hazard Communication, Respirator and operator training

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APPENDIX F

HOSPITAL DIRECTIONS



Send To Printer Back To Directions

Start: [3275-3299] Buckley Rd
North Chicago, IL
60064 US

End: 2615 Washington St
Waukegan, IL
60085-4980 US

Distance: 5.05 miles

Total Estimated Time: 8 minutes

Need InK?

Buy printer cartridges:

Save up to 75%

Free UPS 2-day shipping

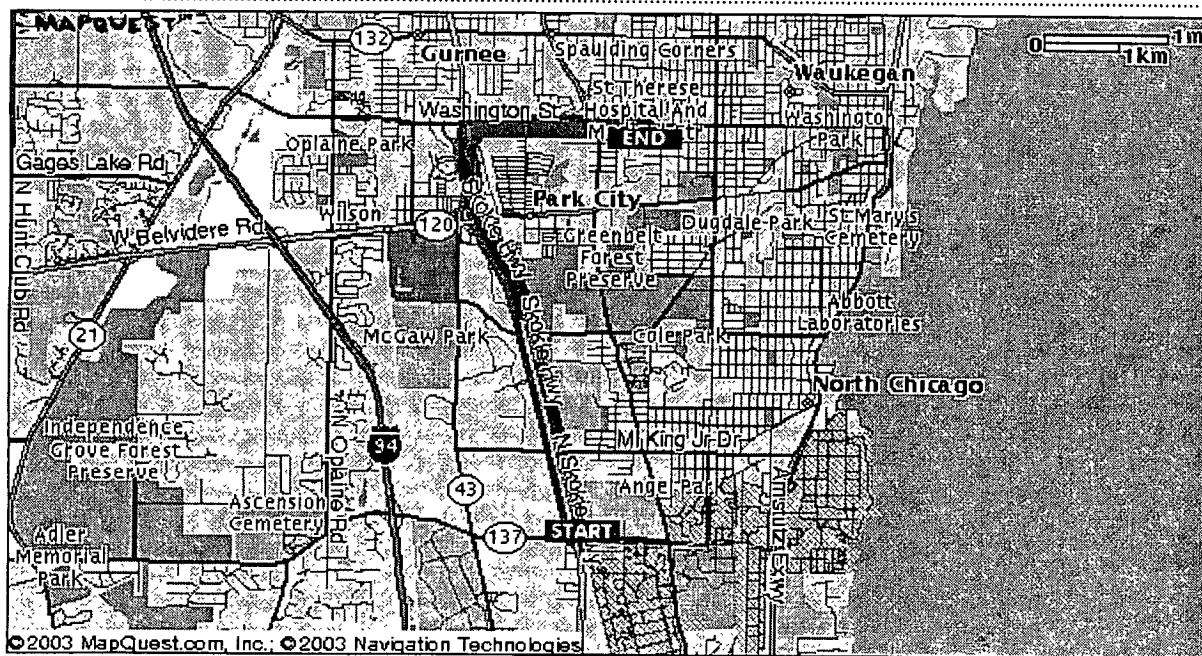
[Buy Now!](#)

www.InkSell.com

✓ Driving Directions

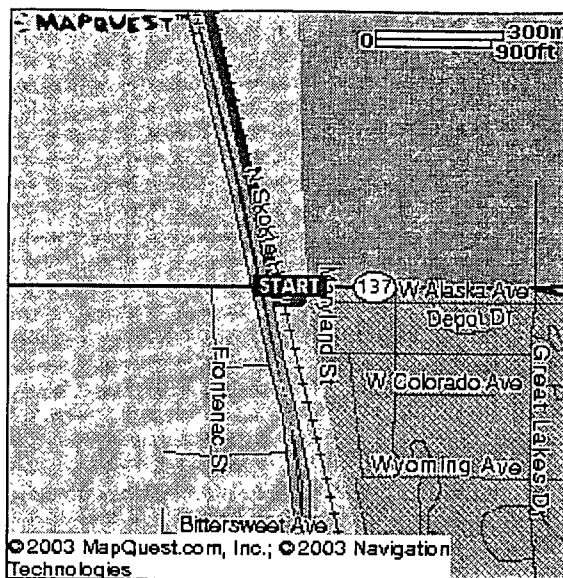
Distance

- | | |
|--|------------|
| <input type="checkbox"/> 1. Start out going West on IL-137/BUCKLEY RD/CR-20 toward N SKOKIE HWY/US-41 N. | 0.04 Miles |
| <input type="checkbox"/> 2. Turn RIGHT onto N SKOKIE HWY/US-41 N. | 3.47 Miles |
| <input type="checkbox"/> 3. Take the WASHINGTON ST exit. | 0.17 Miles |
| <input type="checkbox"/> 4. Keep RIGHT at the fork in the ramp. | 0.07 Miles |
| <input type="checkbox"/> 5. Merge onto WASHINGTON ST. | 1.31 Miles |



Start:
[3275-3299] Buckley Rd
North Chicago, IL
60064 US

End:
2615 Washington St
Waukegan, IL
60085-4980 US

**Notes:**

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